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AND
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CONTENTS.

PAGE.
APPLICATIONS FOR LETTERS PATENT 113
NOTICE TO OUR READERS AND SUBSCRIBERS 115
THE COUNCIL OF THE INVENTORS' INSTITUTE ON THE NEW PATENT BILL 115
REVIEWS—
  People's Museums 116
  Progress of British Trade 116
  Darwin's Insectivorous Plants..................... 117
RHEEA, OR CHINA GRASS FIBRE 117
CORRESPONDENCE 117
  Producing Colour Photographs 117
  Air as Fuel 117
THE PATENTS FOR INVENTIONS BILL, 1875... 118
PETITIONS ON THE PATENT BILL 118
COPYRIGHT OF DESIGNS BILL..................... 118
PROCEEDINGS OF SOCIETIES—
  Royal Institution.. 119
  Geographical Society 119
  Anthropological Institute 119
  Physical Society 119
  Society of Arts 119
  Geological Society 119
  Entomological Society 119
PREMIUMS AWARDED BY THE INSTITUTE OF CIVIL ENGINEERS, 1874-75 120
EXHIBITION OF SCIENTIFIC APPARATUS 120
REGISTRATION OF TRADE MARKS 120
NOTICE TO CORRESPONDENTS 120
PROCEEDINGS OF THE INVENTORS' INSTITUTE 121
MONTHLY NOTICES 121
EXHIBITION OF APPLIANCES FOR THE ECONOMY OF LABOUR AT MANCHESTER ... 122
CORNELIUS VARLEY 122
APPLICATION FOR LETTERS PATENT 122
ADVERTISEMENTS 128

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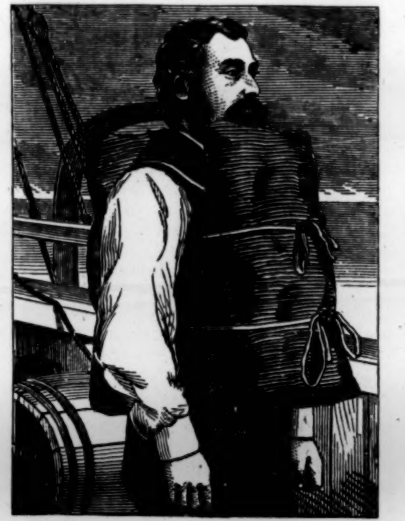

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APPLICATIONS FOR LETTERS PATENT.

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BRITISH MUSEUM

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(Continued on page 122.)

NOTICE TO OUR SUBSCRIBERS AND READERS.

Arrang ments are progressing for the improvement and ultimately the enlargement of the SCIENTIFIC REVIEW. In the present number special attention is directed to the communication on the subject of "Producing Colour Photographs."

SCIENTIFIC REVIEW
AND
Scientific and Literary Review.
A RECORD OF PROGRESS IN
ARTS, INDUSTRY, AND MANUFACTURES,
INCORPORATING THE
JOURNAL OF THE INVENTORS' INSTITUTE.

AUGUST 1, 1875.

THE COUNCIL OF THE INVENTORS' INSTITUTE ON THE NEW PATENT BILL.

It will be seen by reference to other columns that the Executive Council of the Inventors' Institute has agreed to petition the Legislature on the new Bill as hereafter stated. We give the document in its entirety, because it is a succinct summary of nearly all the points in which the Bill requires alteration. After the usual formal superscription it states:—

1. That the number of examiners and assistant examiners and the arrangements in respect to them, as stated in the said Bill, are inadequate and unsatisfactory.

2. That the referees for patents, and the duties proposed to be performed by them, are unnecessary and objectionable.

3. That to supersede (as is done by clause 8) the provisional specification, would be a great evil, as it is necessary that the first step in obtaining a patent should, as now, be effected, on deposit of a provisional specification; except when the applicant for a patent prefers to deposit a complete specification.

4. That it is not desirable to authorise (as is done by clause 11) an examination into anything beyond sufficiency of specification and novelty, as no human examiners can be competent to judge as for all the world in regard to what is to be deemed useful or frivolous in an invention.

5. That even with regard to the decision on novelty, there ought to be an appeal or appeals (which should not be simply permissive as in clause 13).

6. It is not desirable in any case to limit the duration of a patent to seven years (as referred to in clause 11), but, on the contrary, the duration of every patent should not be less than 14 years, and it is recommended that all patents should endure for 21 years without prolongation.

7. That it is highly objectionable that the duration of a patent should end with the termination of a foreign patent (as in clause 20), especially in the case of a true and first inventor, who, although a British subject, happens to be resident out of the United Kingdom.

8. That to entail absolute forfeiture of a patent because the invention is not put in practice within two years (as in clause 27, sub-section *a*), is undesirable.

9. That the obligation to license (sub-section *b*, clause 27) is undesirable.

10. That it is not desirable that there should be power given to anyone to compel the deposit of models (as by clause 49), for thereby considerable and indefinite expense may often be entailed on an inventor.

11. That the Bill does not (see schedules) provide for any appreciable reduction of the present high scale of stamp duties, which it is desirable (both those on the grant and those deferred) should be materially reduced; it being recommended that the total cost for obtaining the Great Seal should not exceed ten pounds.

12. That a provisional or preliminary protection should be obtainable for one pound.

13. That days of grace for payment of stamp duties be allowed on payment of a moderate penalty.

14. That when a patentee desires to pay all stamp duties in one sum he should be able to obtain a discount on such payment.

Reviews.

PEOPLE'S MUSEUMS.

A Circular Scheme for Establishing the People's Museum of Human Anatomy, Physiology, and Popular Surgery (including a Department of Popular Medicine), to be Erected and Endowed by Government (equally urgently and vitally needed in all our large Provincial Cities and Towns).

In this leaflet Mr. Harvey gives the following statement as to an important project; we give his *brochure* entire :—

Sir,—Like the People's Museums of Physical Astronomy and the People's Geographical Gardens, the People's Museum of Human Anatomy, Physiology, and Popular Surgery (for the Museum of Comparative Anatomy and Physiology has yet to come), is expressly designed and intended to familiarize, illustrate, enlighten and instruct both the middle and the working classes in whatever can be illustrated, taught, and told through the eye alone, without the immediate need, aid, or necessity of books, &c., of these three most important sciences!

By judicious common sense manipulation, in no way above and beyond the ordinary mental capacities and comprehension of the intelligent, though thus far untutored and unlettered million, and thus offering no chance, no excuse or reason (which, unfortunately, all our public educational museums and institutions without exception do), for not fully and clearly comprehending what they see before them.

Of all educational museums we hold this to be the most useful, the most vital, and the most religious inspiring to the masses.

Those masterpieces (of dissections now hidden and buried under glass cases) of the intelligence, perseverance, and marvellous skill of prize students of our London medical schools, anatomical preparations and subjects (in their entirety and in parts), should be here arranged all round the museum in the order of their importance, and showing, as it were, how the Divine Architect has successively built up His last and greatest handiwork—man; and where the natural size fails to make obvious and clear to the eye and the mind, art has stepped in to supply the colossal one modelled from wax.

Though each and all are distinctly tabulated, yet throughout, side by side, are placed clear and ample printed explanations and information, whilst round the walls hang numberless large anatomical, physiological, and surgical diagrams and charts. A religious temple of God, providing life-saving food, and must endure for all time to come, raising the masses of this good and great country—those stalwart pioneers of progress, who are now, alas, helplessly and piteously leaning upon an army of skilled physicians for peace of body, to the level of their true dignity, physical integrity, moral beauty and happiness, self-supporting, and self-sustaining, going far to remove and dispel that profound, sinful, and suicidal ignorance of ourselves, conspicuous both in the middle and the working-classes of this country, going far to diminish most materially and beneficially that stupendous and appalling national vice, intemperance, in all its phases, whether of alcohol or otherwise, going far to remove that equally injurious and wide-spread vice and refuge of habitual and indiscriminate medicine taking, which necessitates every chemist and druggist in the kingdom, and their name, alas, is legion, to keep in readiness a store of no less than 1,500 mineral and vegetable drugs.

Such is our mental and moral sickness, which, like bodily sickness, earnestly and urgently appeals for its museum Hospital Saturday, ever holding prevention better than cure, for the purpose of raising needful and adequate funds to erect and endow especially these museums (possibly the others mentioned) in all the great cities and towns of the country.

Fronting us, then, our attention should be first directed to that wonderful assemblage of 198 bones in their natural order and juxtaposition, the skeleton, front, back, and side views, and separately those of the head, the trunk, and the extremities; also the constituents of which bone is made, fibre, cartilage and earthy matter, and here we observe our thirty-two permanent teeth, and, in fact, all the processes of dentistry, with the operating instruments used, familiar as they are to us are too often our sepulchres by which we dig our own graves, even in this incipient state, self-control, that Divine government within us, being absent.

Further on, we observe the same assemblage of bones, but maintained in their proper positions by the ligaments or joints connecting or fastening one bone to another, also the interposed cushion or cartilage between them.

We should next stand before that complicated dynamical apparatus by which motions are immediately produced, namely, masses of flesh called the muscles, with their extremities or tendons which connect them to the bones, 400 in number, superposed in layers varying from one to six in number named and classed either from their forms, positions, or actions.

The involuntary, situated within, the voluntary located upon the external parts of the skeleton, and separately the muscles of the head, the trunk, and the extremities, the special uses and purpose of each being clearly indicated in print. And here we should see something of muscular education or gymnastics, as the prominent muscles of the dancer, blacksmith, acrobat, and how and where the preternatural exercise of muscular power leads to rupture in one or both sides. The writer believes that health, strength, and longevity consists in never allowing (beyond a day) any of the muscles to become automatic, but always under the domain of consciouness.

Passing on, we should next stand before the nervous system—that empire and supremacy of the corporeal structure, the link between mind and matter, the soul with the body. The recipient of expressions from without and the messenger of dictates from within, requiring most careful examination, commencing with (1st) the cerebro-spinal system of nerves which presides over the functions of sensation and volition, and next (2ndly) the ganglionic system or great sympathetic nerve which presides over those of nutrition and circulation, in fact whatever is independent of the will and consciousness. Of the former we observe the convoluted cerebrum, or brain properly so called, extending over the entire skull and covering the lamellated or foliated cerebellum and the medulla oblongata, which last is a continuation of the spinal cord. From the latter forty-three pairs of nerves arise, of which twelve pairs are cranial as the olfactory optic and auditory nerves. From the spinal cord we should observe the thirty-one pairs which issue from each side. (A nerve greatly magnified resembles exactly a section of a telegraph cable.)

And here should be the appropriate place where we should be able to study all that can be shown of that much-abused but very important science of phrenology with its 100 organs, that mental differences correspond to differences as the shape of the head, which again corresponds to differences as the development of brain.

Here the intemperate may well stand aghast before these delicate, yet obedient filaments. It would be easier to pull asunder the chain cable of a man-of-war as perpetually to try and violate with impunity them.

Proceeding further, we should come to that wonderful hydraulic apparatus, the circulation containing the blood supplying the constituents necessary to replace the waste of the body, which are again restored by the processes of digestion and respiration, all three being mutually dependent.

The arterial system, with a colossal model in section of the heart, exhibiting its four chambers should here be seen. Beyond are the lymphatics pervading every part of the organism, its great trunk, the thoracic duct, also the lacteal vessels, and especially the glands.

We should arrive at respiration, by which venous is converted into arterial blood. The seat of this process, the lungs, (a large model of which should be seen,) is before us, the interchange through the membrane taking place by exosmose and endosmose.

We should next be able to see all the mechanical, chemical, and physiological phenomena of digestion, as the alimentary canal distinctly shown, and all the details so deeply important; and here should be the fitting place for the display of all the flesh-forming and heat-giving foods, &c., and so we should be able to see something of the processes of assimilation, of exhalation (and something of ventilation and fresh air, &c.), of secretion, of the skin, and of the senses, &c., &c. For instance, colossal models of the eye, and the ear, with their several parts, and collaterally, whatever appertains to them; so of the tongue, &c. Proceeding onward we should be able to enter the museum or department of popular surgery, where we should be able to observe, for instance, all the articles needed for the immediate and subsequent dressings of wounds, as lint, compressers, rollers, sticking plaister, silk, torniquet, &c.; bleeding, how to arrest it, &c., treatment of incised, punctured, lacerated, and contused wounds, bruises and contusions, burns and scalds, frozen limbs and sunstroke, sprains, dislocations, fractures, or broken limbs, lodgment of foreign bodies, &c., poisoning (symptoms of and treatment), suffocation by drowning, with the rules and management of the Royal Human Society and Royal National Life Boat Institution, &c.; transport of injured persons and invalids; with numerous appropriate and explanatory diagrams displayed round the room.

The Materia Medica or Pharmacopiœa (a classified catalogue of medicines, their uses and purpose, something of which could and should be displayed here, and a description of our most general diseases, with the mode of treatment and the remedies and medicines necessary, &c.

Cheap popular elementary books, treatises either upon the entire subjects or upon each separately, also lectures on home nursing, and management of children, should be procurable, the case in the museum of physical astronomy.—I am, sir, your obedient servant,

AUGUSTUS JOHN HARVEY,
F.R.G.S., F.S.A.

1, South Bank, Regent's Park,
London, 1875.

PROGRESS OF BRITISH TRADE.

"The Progress of our Foreign Trade, Imports and Exports, during the Past Twenty Years." By SPEPHEN BOURNE, F.S.S.

This is a most valuable little treatise (read before the Statistical Society, 18th May, 1875,) on the important subject above mentioned. We will give our readers a notion of its contents :—

On the whole, it will be seen that our imports are now £370,000,000, against exports of £297,000,000. In olden times this would have been thought a serious evil. It was at one time considered that the country which received goods to a greater value than it returned must inevitably become impoverished. A different theory then arose. It was thought that no country (not being one in which the precious metals existed) could go on paying in goods more than it got back, and therefore it must be taken that in some way or other the exports, though smaller in amount, did in fact meet the claims upon us for the larger imports. Consequently, that the disparity between the two was a source of congratulation, since the excess of value in the one over the other was really so much wealth accruing to us as the balance of our trading operations. To a certain—perhaps a considerable—extent this was true. The export values being fixed at the time of shipment, did not represent the charges of transit or the profits to those who shipped them; whilst the import values being those at the time of arrival, did include the expense of bringing them and the profit on their sale by the first importers, most of all of which accrued to this country as being the greatest carrier both out and home, as well as the depot in which they are sold. Such an explanation, however, cannot serve to account for so large a difference as now exists. This to the minds of many can only be accounted for in one of two ways: either that there is some error in the method by which the values are ascertained, or that we are really doing a business which is alarming in its tendency towards ultimate bankruptcy. But surmises and fears like these may well be dismissed, and the belief that the difference is really an accession to the accumulated wealth of the country fully entertained.

After considering the question that a large portion of British capital is invested in foreign industrial operations, whereby we are gainers to the extent of the share of British capital therein (a very pregnant question for our working classes, by-the-bye), Mr. Bourne adds:—

Still, the question arises on the face of these figures, whether, in truth, the trade of the kingdom has not received a decided check. It will be seen that 1871-72-73 were the years in which it seemed to have reached its highest point, and that 1874 contrasts unfavourably in every particular. The percentages of increase which in the former years had reached, for imports retained 136, for exports of foreign goods 225, and of British 164 per cent., have in the last receded to 156,209, and 146 respectively. The four months of the present year [Imports in 1874, £123,915,925; in 1875, £119,549,154. Exports (British) in 1874, £77,234,345; in 1875, £73,282,069] manifest a considerable decline upon the corresponding period of last year, and would thus evidence that the diminishing process is still going on. Time alone will show whether this is one of those cycles of comparative stagnation from which we have often before recovered, or whether the conditions which regulate the relations of capital and labour to each other have not really so changed that we are transferring our superiority to other lands. Enough, however, has been said to show the enormous strides which British commerce and manufacture have made within the last twenty years. We may yet indulge the hope that our prosperity not having reached its climax, will shortly manifest as great a revival as we have ever witnessed before, and will in future years attain still greater magnitude, if not with quite so rapid a growth as hitherto has rewarded our national enterprise, wealth, and skill.

DARWIN'S INSECTIVOROUS PLANTS.

"Insectivorous Plants." By CHARLES DARWIN, M.A. F.R.S. With Illustrations. Murray.

THIS, like the other works of Mr. Darwin, is a masterpiece, and though one may demur to the validity of the conclusions arrived at, yet cannot deny that the case is such as to be very difficult to answer; we are, however, compelled to defer full consideration of the work for the present.

RHEEA, OR CHINA GRASS FIBRE.

ON this subject we copy the following from the *London Gazette*:—

India Office, 25th June, 1875. The Secretary of State for India in Council has decided, in the event of a sufficient number of competitors coming forward, to make arrangements for a series of trials to take place in this country, early in November next, with the object of ascertaining the best methods for the preparation of the Rheea fibre, from either the fresh or the dried plant, by mechanical, chemical, or other means.

The necessary space, motive power, water, and other facilities will be supplied by the Government, but competitors will have to arrange for the working of their machines or processes under their own supervision, or that of their representatives. The utmost care will be taken to secure reliable results, and to make public the whole of the details connected with the experiments, but it is not intended that any prize shall be awarded on the occasion.

Forms of application for taking part in the proposed competition, together with samples of the Rheea in its dried state, may now be obtained from the undersigned. Samples of fresh Rheea will probably be also available for distribution in the course of a few weeks.

The exact date and place of the trial will be subsequently announced. — J. FORBES WATSON, Reporter on the Products of India.

Correspondence.

AIR AS FUEL.

To the Editor of the SCIENTIFIC AND LITERARY REVIEW.

SIR,—Whilst thanking you for your favourable review of the second edition of my little work, "Air as Fuel; or, Petroleum and other Mineral Oils Utilised by Carburetting Air and rendering it Inflammable," which appeared in your issue of the 1st of June ult., I ask your permission to correct a slight misprint which occurred in it. The omission of the words between brackets in the following sentence has confused the meaning which it was intended to convey.

As printed in my book it reads as follows:—"The specific gravity of the vapour at this temperature being $2{\cdot}85 \times 0{\cdot}1083 = 0{\cdot}30865$ by comparison with air, it follows that as 1lb. of [*air at 32° F. is equal to 12·39 cubic feet, the volume of vapour from 1lb. of*] spirit would at the same temperature be 40·14 cubic feet, and following the laws which regulate the diffusion of gases, would occupy precisely the same space when absorbed by air as if it were in a vacuum, so that it would enter into and fully saturate 40·14 cubic feet of dry air."

You would confer a favour on me if you would insert this correction in the next impression of your interesting periodical.—I am, sir, your obedient servant,

THE AUTHOR OF "AIR AS FUEL."

July 10th, 1875.

PRODUCING COLOUR PHOTOGRAPHS.

To the Editor of the SCIENTIFIC AND LITERARY REVIEW.

SIR,—The photography of colours, just as they appear in nature, is a problem despaired of by some as "too good to be true," and by others on the ground that every distinguishable tint and shade would require a different chemical in the preparation of the sensitized paper; and that such chemicals would inevitably cancel or interfere with one another. At all events, whatever be the reason, certain it is that anyone who talks seriously of photographing colours is regarded as a visionary.

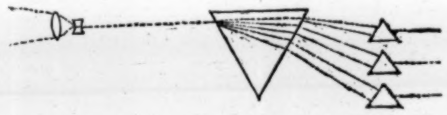
Nevertheless, I submit the following process as one which most will admit to be plausible, and which I, for my own part, feel convinced only requires development in order to render it as faithful a copyist of the colours as ordinary photography is of the lights and shades in the objects around us.

But before describing the nature of the invention I will explain how it is that I prefer, through your courtesy and with your permission, to give it to the public rather than to patent it and retain it in my own exclusive possession. In the first place, I think it is more likely to be speedily developed and brought to perfection, when those interested in it and occupied upon it feel free and unfettered; and, secondly, such is the present state of the Patent Laws, with every prospect of becoming worse and worse, that I do not care to avail myself of the privelege thereby conferred upon me of ruining myself in self-defence against piracy and infringement.

This said, I will proceed with the invention; first the description and then the explanation.

The apparatus is simple, and it is placed between the object to be photographed and the lens.

It consists of four prisms, one large and three small, arranged as shown in the diagram.



The rays from the object will first traverse the large prism, after having been focalized and rendered parallel by two lenses. A spectrum is thus formed of which of course the blue rays are the most refrangible, and the red the least so.

The spectrum is then divided into three groups by the three small prisms. The red rays pass through the uppermost small prism, which being *similar* to the large one, only *inverted*, again makes the rays parallel and reproduces the image, but only the red parts thereof, and parts containing a mixture of red, such as orange, or pink or purple; such medium tints being fainter or stronger according to the quantity of red contained. These rays are now expanded by lens to the required size, and a photograph is taken. The same is done with the blue rays, and the same with the yellow.

We have now three negatives, of which if prints are taken on ordinary prepared paper we have the same picture; except that in one all the reds and yellows appear as black, and only the blues as white; in a second the yellows only appear as white, the blues and reds being black; and in the third the reds alone are white. It need hardly be said that the red plate would require exposure twenty times as long as the blue, and so on. At the same time red rays if exposed long enough do produce the required chemical changes; and as the blue rays would not interfere with such exposure, the effect might be obtained as strong as required; indeed, the reds might, if desired, be brought out so as to appear whiter than the blues. So far, however, we have no coloured photographs. It is well known that monochromes of any or nearly any required tint may be obtained by employing different chemical preparations. A sensitized paper is, therefore, taken, upon which the action of light produces a red picture; and to the paper the negative obtained by the red rays is applied. This picture gives us, of course, all the reds just as they are in nature; except that where they are in nature mixed with blue or yellow, here they are merely fainter shades of red.

After fixing, this paper is again treated like ordinary paper and re-sensitized, but this time so as to produce a yellow picture.

We have now all the reds, all the yellows, and all the intermediate shades of orange, correctly shown in the picture. This is again fixed and again sensitized; this time so as to obtain a blue effect, and the glass obtained by the blue rays is applied; filling in all the remaining tints of nature.

The result is a coloured photograph as perfect as the purity of the ground colours used will permit.

Now, I have spoken for simplicity's sake of sensitizing the paper as though for monochromes; but there is no doubt that the appropriate process for this purpose is the heliotype. Here we have a gelatinous deposit fixed and hardened when required, and dissolved and washed away when not wanted. This gelatine may of course be of any required colour, and any number of successive layers may be superimposed. Transparent colours being used, the mixed shades would be as exact as possible, and the effect charming.

It is hardly necessary to enter further into detail than just to remark that the original negatives obtained would first have to be reversed—that is positives on glass must be taken from them and applied to the paper.

Coloured glasses might be employed instead of the system of prisms, but the effect therefrom is very unfaithful and imperfect, owing to the difficulty, nay, impossibility, of excluding all colours save one by means of coloured glass. If this idea meets with the approbation of any competent to judge, I shall be glad to have their opinions.—I am, Sir, yours obediently,

WORDSWORTH DONISTHORPE.

THE PATENTS FOR INVENTIONS BILL, 1875.

THE following is a copy of the Petition of the Patent Agents recently presented to Parliament:—

To the Honourable the Commons, &c., the petition of the London Patent Agents in general meeting assembled,

Humbly sheweth, that your petitioners are professionally engaged in practice in London as patent agents, and having in several general meetings very fully and carefully considered the Bill introduced into Parliament by the Lord Chancellor to amend the law relating to Letters Patents for Inventions as now before your Honourable House, beg very respectfully to submit the following amendments to your consideration.

1. That, to ensure efficiency, it is desirable that one or more paid commissioners should be appointed, to be selected for his or their technical, scientific, and legal knowledge, and that all matters and cases in reference to patents should be heard and decided before such paid commissioner or commissioners, subject to an appeal to the Lord Chancellor.

2. That all patent agents be registered under such regulations as the commissioners shall make, and such be allowed to practice in all matters before such commissioner or commissioners.

3. That the number of examiners and assistant examiners provided for in the Bill is inadequate, and that neither the referees for patents, nor the duties proposed to be performed by them are necessary or desirable.

4. That the examiners, if any such be appointed, should be disqualified from holding any interest, direct or indirect, in any patent or in any manufacturing operations, either during his term of office or for such period after quitting office as at the least shall cover the period for which patents are granted.

5. That the application by an applicant lodging a provisional specification as provided by the Act of 1852, has been found to work well and should be retained, but where desired, the applicant may as at present file a complete specification. That the final specification should be filed within six months from the date of application, and that whatever examination be adopted be made after the filing of the complete or final specification.

6. That notice of filing the complete or final specification be published, and that any person having an interest in opposing the grant may lodge notice of opposition with particulars of his objections within a prescribed time, and that no opposition should be permitted to be filed or allowed at any other time than after the filing of the specification.

That the objections (if any) with particulars thereof be referred to the commissioner or commissioners, together with the report of the examiners.

7. That the complete or final specification when filed, be thereupon open to inspection by the public, and such filing be equivalent to notice to proceed. That formal notice to proceed, if necessary for any reasons, be given at the same time. That the patent be sealed within three months from the date of filing the final specification.

That the period for which the provisional protection be granted be nine months.

8. That the giving power to the examiners to decide as to the utility, great importance, or frivolous character of an invention, is most undesirable.

9. That the examiners shall report not only whether the specification is *prima facie* sufficient, but also whether it accords with the title and with the provisional specification.

10. That it is not desirable in any case to limit the duration of a patent to seven years, but that, on the contrary, the duration of every patent should be for 21 years.

11. That the examiner shall lay his report with application, specifications, and relative documents before the commissioner or commissioners, who shall consider the same, and shall hear the applicant, and any opponent, and then print and publish the application and specifications *only*.

12. That when the report of the examiners on the question of novelty is adverse, and the applicant fails on appeal in convincing the commissioner or commissioners that there has been no anticipation of his alleged invention, he shall nevertheless be allowed to take a patent, on the condition that he sets out in his specification the particulars of the alleged anticipation, and states wherein he considers his invention differs therefrom in novelty.

13. That a patent should be allowed to be sealed at any time, as prescribed, after filing the complete or final specification, but that any patent sealed out of order shall have only the same effect as against other patentees as if sealed in due course.

14. That all patents granted ought to remain in force irrespective of foreign patents. That a patent shall not be granted on the application of a foreign inventor; unless the applicant declares himself to be the first and true inventor, or his legal representative, and no patent shall be granted in respect of a communication from abroad except from the true and first inventor.

15. That there should be no power to revoke a patent for the non-user thereof.

16. That it is desirable to restrict the obligation to license to cases where the improvements are applicable to existing machinery or processes.

17. That, in default of agreement, between the inventor and the Crown, the terms should be settled, not by the Treasury, as proposed, but by the same authority as shall fix the terms for a compulsory license.

18. That it is not desirable to require the deposit of models in any case.

19. That the rules, when made, should be laid before Parliament before coming into operation.

20. That it is desirable that all stamp duties required to be paid by inventors be very materially reduced and that the entire stamp duties up to and including the grant of Letters Patent should not exceed £10. That a yearly tax, which would produce a revenue equal to that now derived from patent stamps, would be preferred by many. That if the existing system be retained, the payments now made at the third and seventh years should be reduced and postponed to the fifth and tenth years.

21. That a clause should be introduced providing for certain days of grace, for payment of stamp duties, being allowed on payment of a moderate penalty.

Therefore your petitioners humbly pray, &c.

To Mr. C. G. CARTTAR, the Secretary of the Patent Agents' Committee, we have to acknowledge ourselves indebted for the above.

PETITIONS ON THE PATENT BILL.

RECENTLY the following petitions against the Bill have been presented to the House of Commons:—From the Bradford Chamber of Commerce (June 24), Bradford and District Trades Council (June 24), members of the Southampton Trades Council (June 25), and from Frederick Joseph Bramwell, President of the Institution of Mechanical Engineers (July 6). Petitions for alterations have been presented from the inhabitants of Liverpool (June 23). Inhabitants of Bedford (June 23). Members of the Patent Law Committee (June 24), and from the working men of Rochdale (June 24). Mr. C. E. Parker Rhodes (June 29) prays for Royal Commission to consider some proposals which he makes with a view to the reform of the Patent-laws. Up to the 6th ultimo 21 petitions, with 246 signatures, had been presented against the Bill; 24 petitions with 905 signatures pray for alterations; one petition with one signature asks for a Royal Commission, and one petition with 179 signatures prays for a Select Committee. There is no petition in favour of the Bill, but several have been presented since the above list was made up, and one from the Council of the Inventors' Institute is intended to be. The Bill, according to a statement made in the House of Commons by the Attorney-General, is not to be proceeded with this session.

COPYRIGHT OF DESIGNS BILL.

THE objects of this Bill, introduced into the House of Lords by the Lord Chancellor, are to enable the Commissioners of Patents to exercise all the functions and powers formerly vested in the Board of Trade. It will come into operation on the 1st of January next, and may be cited as "The Copyright of Designs Act, 1875." The Commissioners of Patents are empowered to make, and when made to revoke and alter, general rules for regulating registration under the various Designs Acts. The discretion or power vested in the registrar under the said Acts to be subject to the control of the Commissioners of Patents, and be exercised in such manner and with such limitations and restrictions as may be prescribed by the said general rules. Rules made under this section are to be laid before Parliament. The office of registrar under the former Acts to be abolished, but the Commissioners of Patents are to make suitable arrangements for the proper performance of the duties of the registrar and for the other duties directed to be done under the former Acts of Parliament. Any delegation of duties to the clerk of the Commissioners of Patents made by the Board of Trade shall be as valid as if it had been done under the powers of the Act now before Parliament. The Acts referred to in the schedule are 5 and 6 Vict., cap. 100; 6 and 7 Vict., cap. 65; 13 and 14 Vict., cap. 104; 21 and 22 Vict., cap. 70; 24 and 25 Vict., cap. 73.

Proceedings of Societies.

ROYAL INSTITUTION.

July 5th.—The Duke of Northumberland, President, in the chair.—Sir J. Whitworth, Bart., Messrs. J. T. Morgan and J. B. Scriven were elected Members.

GEOGRAPHICAL SOCIETY.

June 28th.—Major-Gen. Sir H. C. Rawlinson, President, in the chair.—The following gentlemen were elected Fellows:—Earl of Mayo, Right Hon. Sir J. Fergusson, Bart., Hon. Guy C. Dawnay, Col. Hon. W. Fielding, Capt. J. T. Greenfield, Capt. H. H. H. Walshe, Lieut. F. G. I. Lillingston, Rev. F. C. Jagg, Staff-Commander T. A. Hull, Messrs. E. Blount, H. Bond, F. Buckley, E. Coates, J. M. Dunn, H. J. Gotto, J. W. Hughes, J. R. Madan, A. Maudsley, J. E. Middleton, D. L. Mundy, C. Orred, Phillips (Vice-Consul, Kertch), J. C. A. Scott, E. M. Warden, F. Youle, C. L. Webb, and H. G. Yates. The papers read were, "Journey across the Interior of Western Australia," by Mr. J. Forrest, and "Recent Observations of the Challenger and Tuscorara, and their Bearings on the Temperature Theory of Oceanic Circulation," by Dr. W. B. Carpenter.

ANTHROPOLOGICAL INSTITUTE.

June 22nd.—Col. A. Lane Fox, president, in the chair.—Mr. F. Claudet was elected a Member.—A paper, by Mr. H. Spencer, was read, "On the comparative Psychology of Man." The author commmenced by showing the necessity for division of labour in a systematic study of psychology, and proceeded to map out the subject into divisions and subdivisions, and to indicate the manner in which its various branches might be investigated. The chief divisions were mental mass and complexity, the rate of development, plasticity, variability, impulsiveness, difference of sex, the sexual sentiment, imitation, quality of thought, peculiar aptitudes, with their many subdivisions. Mental effects of mixture, and the inquiry how far the conquest of race by race has been instrumental in advancing civilization, would also come within the scope of comparative psychology. Though, after occupying themselves with primitive arts and products, anthropologists have devoted their attention mainly to the physical characters of the human races, it must, the author thought, be admitted that the study of those yields in importance to the study of their psychical characters. A knowledge of the reciprocal relations between the characters of men and the characters of the societies they form must influence profoundly our ideas of political arrangement. A comprehension of mental development as a process of adaptation to social conditions, which are continually re-moulding the mind and are again re-moulded by it, will conduce to a salutary consciousness of the remoter effects produced by institutions upon character, and will check the grave mischief which ignorant legislation now causes; and, further, a right theory of mental evolution, as exhibited by humanity at large, giving a key, as it does, to the evolution of the individual mind, must help to rationalize our perverse methods of education, and so raise intellectual power and moral nature. Mr. J. Forrest read an account of the natives of Central and Western Australia, whom he had observed during two journeys he had made across the country from Western to South Australia. Among their customs might be mentioned that of tattooing on the shoulders, back, and breast, and the practice of boring noses, which is raised to the importance of a ceremony, when hundreds of individuals gather together for that object. Circumcision he found to be universal. The use of the boomerang was described, and the exaggerated statements concerning the manipulation of the weapon were corrected. Cannibalism was common among the natives of the interior. Many other descriptive details of their faith, manners, and customs were given. A paper by Capt. J. A. Lawson, was read, "On the Papuans of New Guinea." The only part of the coast that the author examined was Houtree, and there, as in the interior, he met with a race of people dissimilar to those described by other travellers who have visited various parts of the coast. There was a marked diversity in stature; in the south of the island the people were shorter than those inhabiting the north. They were possessed of enormous muscular power, and showed a large thoracic development. Their complexion was of a dark tawny, but not black, and their features were of Negroid type.

PHYSICAL SOCIETY.

June 26th.—Prof. G. C. Foster, V.P., in the chair.—The Earl of Rosse, Mr. L. Schwendler, and Mr. R. S. Brough, were elected Members. Mr. W. J. Wilson read a paper "On a Method of Measuring Electrical Resistance of Liquids." Great difficulty has hitherto been experienced in measuring the resistance of electrolytes on account of the polarization of the electrodes, and most of the methods hitherto employed have aimed at reducing this to a minimum by using large electrodes and very weak or rapidly alternating currents. The determinations, however, are difficult, and require to be quickly performed. The following method is easy, and is free from both the above objections. The arrangement in its most simple form consists of a long narrow trough filled with the liquid to be measured, say dilute acid. A porous pot, containing a zinc plate in sulphate of zinc, being placed in the acid at one end of the trough, and a similar pot with a copper plate in sulphate of copper in the acid at the other end, the whole arrangement forms a sort of elongated Daniell's cell, the chief resistance of which is in the long column of acid. The circuit between the plates being completed through a resistance box and mirror galvanometer, the current is shunted until a suitable deflection is obtained. One of the porous pots is now moved along the trough towards the other, and, as the resistance of the circuit is thus reduced by shortening the column of acid, the galvanometer deflection largely increases. The external resistance is now increased by means of the box, until the deflection is reduced to the same point as at first. This resistance put into the circuit is evidently equal to that of the liquid taken out, and thus a measure of the liquid resistance is obtained. Two forms of apparatus were shown. In one the vessels, containing sulphate of zinc and sulphate of copper respectively, formed pistons in a glass tube which contained the liquid to be examined. In the other, two pairs of concentric vessels were connected by a bent glass tube which contained the liquid under examination. The method is applicable to a great variety of liquids, and, with care, almost any degree of accuracy may be obtained. The chief obstacle to exact measurements lies in the fact that the resistance of liquids is greatly affected by temperature; but this difficulty is of course, common to all methods. Mr. Wilson has been experimenting with brine, and gave some of the results obtained, but he has not as yet made a sufficient number of experiments to complete a table. A mode of arranging the apparatus in a differential or bridge form was also described, but it has not been found necessary to use it, the simple circuit arrangement giving accurate results with less trouble. Four other communications were made.

SOCIETY OF ARTS.

June 30th.—Annual General Meeting.—Major-General F. Eardley-Wilmot in the chair.—The Report of the Council and the Treasurer's statement of receipts and expenditure were read. The following gentlemen were elected to form the Officers and Council for the ensuing year:—President, the Prince of Wales; Vice-Presidents, the Duke of Edinburgh, F. A. Abel, Sir G. Campbell, A. Cassels, E. Chadwick, Lord A. Churchill, Hyde Clarke, Sir H. Cole, Right Hon. W. F. Cowper-Temple, Major Donnelly, Major-General F. Eardley Wilmot, C. J. Freake, Capt. D. Galton, Right Hon. Lord Hampton, W. Hawes, Vice-Admiral E. Ommanney, Admiral the Right Hon. Lord C. Paget, Rev. W. Rogers, S. Teulon, and E. C. Tufnell; Ordinary Members of Council, G. C. T. Bartley, F. J. Bramwell, Major-General F. C. Cotton, Col. A. Angus Croll, the Hon. D. Fortescue, P. Graham, J. Heywood, E. Lawrence, R. Rawlinson, E. J. Reed, Lieut.-Col. A. Strange, and T. R. Tufnel; Treasurers, Messrs. E. Brooke and J. Murray; Auditors, Messrs. J. O. Chadwick and B. F. Cobb; Secretary, Mr. P. Le Neve Foster; Financial Officer, Mr. S. T. Davenport.

GEOLOGICAL SOCIETY.

June 23rd.—J. Evans, Esq., President, in the chair.—Messrs. D. Adamson, F. D. Longe, and C. Reid were elected Fellows.—The following papers were read: "Some Observations on the Rev. O. Fisher's Remarks on Mr. Mallet's Theory of Volcanic Energy, read May 12th, 1875," by Mr. R. Mallet,—"On the Physical Conditions under which the Cambrian and Lower Silurian Rocks were probably deposited over the European Area," by Mr. H. Hicks,—"On a Bone-Cave in Creswell Crags," by the Rev. J. M. Mello,—"Notes on Haytor Iron-Mine," by Mr. C. Le Neve Foster,—"On the Formation of the Polar Ice-cap," by Mr. J. J. Murphy,—"Notes on the Gasteropoda of the Guelph Formation of Canada," by Prof. H. A. Nicholson,—"Description of a New Genus of Tabulate Coral," by Mr. G. J. Hinde,—"On the Superficial Geology of the Central Region of North America," by Mr. G. M. Dawson,—"On some important Facts connected with the Boulders and Drifts of the Eden Valley, and their bearing on the Theory of a Melting Ice-sheet charged throughout with Rock-fragments," by Mr. D. Mackintosh,—"Observations on the unequal Distribution of Drift on opposite sides of the Pennine-chain, in the Country about the source of the River Calder, with Suggestions as to the causes which led to that result, together with some Notices on the High-level Drift in the upper part of the Valley of the River Irwell," by Mr. J. Aitken,—"On the Granitoid and Associated Metamorphic Rocks of the Lake-district," by Mr. J. C. Ward,—"On the Correlation of the Deposits in Cefn and Pontnewydd Caves, with the Drifts of the Neighbourhood," by Mr. D. Mackintosh,—"Geological Notes from the States of New York," by Mr. T. G. B. Lloyd,—and "On a Vertebrate Fossil from the Gault of Folkestone, which also occurs in the Cambridge Greensand," by Mr. H. G. Seeley.

ENTOMOLOGICAL SOCIETY.

July 5th.—Sir S. S. Saunders, President, in the chair.—Messrs. A. F. Sealy and W. Borrer, jun., were elected Ordinary Members; and Mr. W. D. Gooch was elected a Subscriber. The President announced the decease of Mr. H. Doubleday, one of the original members of this society, and Mr. Stainton made some remarks on the great services that he had done for entomology. Mr. Dunning remarked that the Ornithoptera bred by Mr. Sealy from larvæ taken at Cochin, South India, and exhibited by him at a recent meeting, had been identified as *O. Minos*. Mr. Bond exhibited two specimens of a Cuculio, sent from Nova Fribourgo, Brazil, which were attached to the same twig, and were both attacked by a fungus. Mr. Janson said that they belonged to the genus Hylopus, and were well known to be subject to such attacks. The president exhibited a lock taken from a gate at Twickenham, entirely filled with the cells of a species of Osmia which Mr. Smith said was, most probably, *O. bicornis*, of which he had known several instances in locks. He also exhibited an example of the minute *Hylechthrus rubi*, one of the Stylopidæ, parasitic upon *Prosopis rubicola*, recently obtained from briars imported from Epirus, and remarked upon a method of expanding the wings of Stylopidæ. He also exhibited a series of *Halietus nitidiusculus*, stylopized, and recommended entomologists on the south coast to search in August for stylopized Halieti, especially among thistles. Finally, he remarked on the parasites of Osmia and Anthidium, and enumerated eleven insects attacking the same species of Osmia in its different stages—some devouring the egg and pollen-paste, some the larvæ, and others attacking the bee itself. Mr. Champion exhibited a series of recently captured individuals of *Chrysomela cerealis* from Snowdon, its only known British locality. Mr. M'Lachlan stated that he had recently seen this species in the Department of Saone et Loire in France in great numbers, each ear of wheat having several of the beetles upon it, and remarked on the singular nature of its sole habitat in Britain. The Secretary exhibited nests of a trap-door spider, sent from Uitenhage, near Port Elizabeth, Cape Colony. The nests were not (as is usual) in the earth, but in cavities in the bark of trees, and the "trap-door" appeared to be formed of a portion of the bark, thus rendering it most difficult to detect the nests when in a closed condition. Mr. C. V. Riley, State Entomologist of Missouri, exhibited sundry insect pests that do so much damage in the state, including the Army-worm (*Leucania impuncta*), and the Rocky Mountain locust (*Caloptenus spretus*), and entered at some length into the habits of the latter insect and the vast amount of destitution caused by it, stating that in a short period it devoured almost every living plant, leaving nothing but the leaves of the forest trees, and converting a fruitful country into an absolute desert. From a knowledge of the habits of the insect, and believing in its inability to exist in a moist climate, he had predicted that its ravages would not extend beyond a certain line, and he had seen these predictions fulfilled. Having noticed that hogs and poultry grew excessively fat from devouring the locusts, and considering that the use of them as food for man would tend to relieve some of the distress occasioned in the devastated districts, he had caused a number of them to be prepared in various ways, and they were found to be well suited for food, especially in the form of soup. Mr. Riley also stated that he was very desirous of taking a supply of cocoons of *Microgaster glomeratus* to America to lessen the ravages of the larvæ of the genus Pieris in that continent, and would be greatly obliged to any entomologist who would assist him in obtaining them. The following papers were communicated:—"Descriptions of New Heteromerous Coleoptera belonging to the family Blapsidæ," by Prof. J. O. Westwood,—'Descriptions of a New Species of Myriapod from Mongolia," by Mr. A. G. Butler,—and "Descriptions of New Coleoptera from Australia," by Mr. C. O. Waterhouse. The President stated that this was the last meeting that would be held at Burlington House, and that due notice would be given to the members when the arrangements at the new rooms at 11, Chandos-street, Cavendish-square, were completed, the library having been already removed to that place. The thanks of the members were voted to the Linnean Society for the permission to hold the meetings at their rooms, which had been so long enjoyed by the Entomological Society.

PREMIUMS AWARDED BY THE INSTITUTION OF CIVIL ENGINEERS. —SESSION 1874-75.

THE Council of the Institution of Civil Engineers have awarded the following premiums:—

1. A Telford Medal, and a Telford Premium, to William Hackney, B.Sc., Assoc. Inst. C.E., for his paper on "The Manufacture of Steel."

2. A Telford Medal, and a Telford Premium, to Harry Edward Jones, M. Inst. C.E., for his paper on "The Construction of Gasworks."

3. A Telford Medal, and a Telford Premium, to Alexander Richardson Binnie, M. Inst. C.E., for his paper on "The Nagpur Waterworks, with Observations on the Rainfall, the Flow from the Ground, and Evaporation at Nagpur, and on the Fluctuation of Rainfall in India and in other places."

4. A Telford Medal, and a Telford Premium, to George Frederick Deacon, M. Inst. C.E., for his paper "On the Systems of Constant and Intermittent Water Supply, and the Prevention of Waste, with special reference to the restoration of Constant Service in Liverpool."

5. A Telford Premium to Jules Gaudard, C.E., of Lausanne, for his "Notes on the Consolidation of Earthworks."

6. A Watt Medal, and the Manby Premium, to John Clark Hawkshaw, M.A., M. Inst. C.E., for his paper on "The Construction of the Albert Dock at Kingston-upon-Hull."

7. A Telford Premium to Professor Joseph Prestwich, M.A., F.R.S., Assoc. Inst. C.E., for his paper "On the Origin of the Chesil Bank, and on the Relation of the existing Beaches to past Geological Changes independent of the present Coast Action."

8. A Telford Premium to Josiah Timmis Smith, M. Inst. C.E., for his paper "On Bessemer Steel Rails."

9. A Telford Premium to Charles Colson, Assoc. Inst. C.E., for his "Details of the Working Tests and Observations on Portland Cement, made during the Construction of the Portsmouth Dockyard Extension Works."

10. A Telford Premium to Thomas Colclough Watson, M. Inst. C.E., for his "Description of the Use of Fascines in the Public Works of Holland."

The Council have likewise awarded the following prizes to students of the Institution:—

1. A Miller Prize to Arthur Ernest Baldwin, Stud. Inst. C.E., for his paper on "The Design and Construction of Lock Gates."

1. A Miller Prize to James Charles Inglis, Stud. Inst. C.E., for his paper, "Experiments on Current Meters and their Bearing on the Hydraulics of Rivers."

3. A Miller Prize to William Beswick Myers, Stud. Inst. C.E., for his "Comparison of the various forms of Girder Bridges, showing the Advantages of the Schwedler Bridge; together with an elucidation of the Theoretical Principles of the same."

4. A Miller Prize to Arthur Spence Moss, Stud. Inst. C.E., for his paper on "The River Humber."

5. A Miller Prize to William Patterson Orchard, Stud. Inst. C.E., for his paper on "Hydraulic Calculations relating to Water Pressure and Walls to resist it, Gauging of Water, the Flow of Water in Open Channels and in Pipes."

6. A Miller Prize to Joseph Tysoe, Stud. Inst. C.E., for his paper on "The Manufacture of Illuminating Gas from Coal."

7. A Miller Prize to John Charles Mackay, Stud. Inst. C.E., for his paper on "Concrete."

To the above list the Council of the Institution append the following important notice:—It has frequently occurred that in papers which have been considered deserving of being read and published, and have even had premiums awarded to them, the authors may have advanced somewhat doubtful theories, or may have arrived at conclusions at variance with received opinions. The Council would, therefore, emphatically repeat, that the Institution must not, as a body, be considered responsible for the facts and opinions advanced in the papers or in the consequent discussions; and it must be understood, that such papers may have medals and premiums awarded to them, on account of the science, talent, or industry displayed in the consideration of the subject, and for the good which may be expected to result from the discussion and the inquiry; but that such notice, or award, must not be considered as any expression of opinion, on the part of the Institution, of the correctness of any of the views entertained by the authors of the papers.

EXHIBITION OF SCIENTIFIC APPARATUS.

THIS Exhibition at South Kensington will open on the 1st of April, 1876, and remain open until the end of September, after which time the objects will be returned to the owners. It will, as has been already intimated, consist of instruments and apparatus employed for research, and other scientific purposes, and for teaching. It will also include apparatus illustrative of the progress of science, and its application to the arts, as well as such as may possess special interest on account of the persons by whom, or the investigations in which, it had been employed. The precise limits are detailed under several sections in a syllabus which has been issued for the information of exhibitors. Models, drawings, or photographs will also be admissible where the originals cannot be sent. The apparatus may, in certain cases, be arranged in train as used for typical investigations; and arrangements will be made, as far as it may be found practicable, for systematically explaining and illustrating the use of the apparatus in the various sections. Forms on which to enter descriptions of objects offered for exhibition may be obtained on application to the Director of the South Kensington Museum, London, S.W. These forms should be filled up and returned as soon as possible, so that exhibitors may receive early intimation as to the admissibility of the objects they propose to send. The cost of carriage of all objects selected for exhibition will be defrayed by the Science and Art Department. It is hoped that institutions or individuals having instruments of historic interest will be good enough to lend them. The following are the various sections into which the Exhibition will be divided:—Arithmetic, Geometry, Measurement, Kinematics, Statics, and Dynamics, Molecular Physics, Sound, Light, Heat, Magnetism, Electricity, Astronomy, Applied Mechanics, Chemistry, Meteorology, Geography, Geology and Mining, Mineralogy, Crystallography, and Biology.

REGISTRATION OF TRADE MARKS.

THIS Bill, now before Parliament, is intitled "An Act to establish a Register of Trade Marks." Power is given to the Lord Chancellor to make general rules "for the purpose of carrying into effect this Act," as he may deem expedient. Another instance of handing over the interests of trade to lawyers.

NOTICE TO CORRESPONDENTS.

J.N.—The invention of Mr. Johnstone Napier, of Salisbury, for floating or fixed lighthouses, appears to be worthy of consideration; but as it could not be properly understood without elaborate drawings, for which we have now no room, we can do no more than thus briefly refer to it.

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To Correspondents:—SCIENTIFIC COMMUNICATIONS AND BOOKS FOR REVIEW to be addressed to the Editor at this office; as also letters respecting ADVERTISEMENTS, SUBSCRIPTIONS, &c.—Correspondents are desired to keep copies of their communications, as the Editor cannot undertake to return them.

Editor's Office: 21, Cockspur Street, Charing Cross, S.W.

THE INVENTORS' INSTITUTE,

4, ST. MARTIN'S PLACE, TRAFALGAR SQUARE, LONDON
ESTABLISHED 1ST MAY, 1862.

Past Presidents:

SIR DAVID BREWSTER, K.H., LL.D., F.R.S., &c., from the establishment of the INVENTORS' INSTITUTE, till his decease, February, 1868. LORD RICHARD GROSVENOR, M.P.

President of Council:

SIR ANTONIO BRADY.

Subscriptions are payable to Mr. G. A. STRETTON, the Receiver, 4, St. Martin's-place, S.W., who is the proper official to give receipts.

F. W. CAMPIN, Sec.

Proceedings of the Institute.

A MEETING of the Executive Council of the Inventors' Institute (duly summoned according to the new Rules) was held on 14th July, Mr. F. H. Varley, Vice-President of General Council and Deputy Chairman of the Executive Council, presiding. After confirmation of the minutes of the Meeting of 3rd June, the Secretary, Mr. Campin, reported that since that date he had had further communication with Mr. Mundella, M.P., in regard to the presentation of the petition from the Meeting held at the Society of Arts on 25th May last, and this had resulted in the petition from that Meeting being presented by that gentleman to the House of Commons. The Secretary also reported that he had been in communication with Lord Belper with regard to presenting the same petition in the House of Lords, and that it had been presented by his Lordship. He then explained the nature of the various efforts for the alteration of the Lord Chancellor's new Bill, which he and some other members had taken part in, specially stating that Mr. Carttar had been very active in bringing together and organizing the action of the patent agents and the artizans on the subject.

On the motion of the Chairman, seconded by M. M. Harris, Esq., the Treasurer, it was resolved unanimously that the best thanks of the Council of the Institute are hereby tendered to Mr. Mundella, M.P., and Lord Belper for their assistance in the matter of the petition above referred to.

A vote of thanks to Mr. Carttar for his services in opposition to the Lord Chancellor's Bill was also passed. It was also resolved that the petition to Parliament from the Council of the Institute should be at once prepared and presented without delay. It was then mentioned that in order to the efficient working of the Institute, it was thought desirable that a Finance Committee of the Executive Council should be appointed, who should take the direction of the Finances reporting from time to time to the Executive Council, with power to make all payments which are now required to be made according to engagements already entered into, and such others as may hereafter be directed by the Executive Council, such Finance Committee to consist of the President of Council, *ex officio*, the Vice-President of Council, the Treasurer, C. G. Carttar, Esq., and the Secretary.

On the motion of Dr. McGrigor Croft, seconded by Mr. Calley, the Finance Committee constituted and empowered as above stated was appointed.

The Secretary then brought the question of the SCIENTIFIC REVIEW under the consideration of the Executive Council by stating that the proprietors of this journal having had a proposal made by the Treasurer, had stated that they required further time for consideration, and the Secretary was therefore directed to communicate with those gentleman, and report at next meeting.

The following are members recently added to the list:—Messrs. H. Bland, D. H. Brown, W. Crawley, W. H. Chambers, Captain H. H. Doty, G. Dixon, H. Duckham, P. Egerton, G. Eyre, C. Espir, R. G. Elmes, P. Gamboni, Rev. T. Jones, J. Jowett, Kirkwood, Kaye, G. B. Knott, T. Pearson, M. Prior, T. B. Redman, W. Simons, E. Salt, J. B. Thompson, T. Temple, H. Walters, J. Weir, J. Ward, G. Willett, C. Woodall, M. Zingler.

Monthly Notices.

The Yorkshire College of Science has just issued its first report.

The Prussian Government has bought for the University of Bonn the late Dr. Krantz's collection of minerals.

The Council of the Institution of Civil Engineers have awarded Telford Medals and Telford Premiums to various gentlemen, as fully stated in another column.

A memoir of Mr. Turner, the distinguished Manchester surgeon, written by a relative whose name is not given, has just been published. The book is inscribed to the Principal and Professors of Owens College.

Boiler incrustations are, according to statements in *Farber Zeitung*, entirely prevented by the introduction of a plate of zinc into the boiler. This has been tried in this country, and we have not heard of much advantage attending its adoption.

The poisonous solanaceous plants,—especially belladonna,—is stated by Prof. E. Heckel to have influence on rodents and marsupials, contrary to the general belief that these animals when fed on such leaves are not subject to any ill effects.

A valuable contribution to zoological literature may shortly be expected in the form of a monograph on the Antelopes, Sheep, and Oxen, or Cavicorn Ruminants, by Sir Victor Brooke, Bart., who has made this group of the Ungulate animals a subject of special study for some time past. The illustrations will be numerous, and particularly carefully executed by Mr. Smit, on stone.

The Miners' Association of Cornwall and Devon have just issued their Reports and Proceedings for 1874-5. This society gives instruction in chemistry, mineralogy, mining, and some branches of physics to the working miners. At the last examination of the Science and Art Department, thirty-three of the students passed successfully in mineralogy, twenty-five in chemistry, thirteen in the principles of mining, and seven in steam.

Metallic barium, has been proposed to be prepared by M. Sergius Kern, as published in the *Chemical News*. Pure iodide of barium is first obtained by acting on barium hydrate with iodine, and passing a current of sulphuretted hydrogen through a solution of the product, whereby any iodate is converted into iodide. On heating the iodide with metallic sodium, the barium is set free, and may be separated by means of mercury.

The Potato Disease, at a recent meeting of the Royal Horticultural Society, was referred to by Mr. Worthington Smith, who announced a discovery relating to the history of that disease. Mr. Smith has discovered what so many have sought in vain—the "resting spore" and the "antheridium" by means of which the spore is fertilized. It is said that the so-called new potato disease is nothing more than *the* potato disease in a different form. Mr. Smith's paper appears in full in the *Gardeners' Chronicle*.

According to the Berichte of the German Chemical Society, the action of sulphuric acid on lead and its alloys has recently been studied by Herr A. Bauer. On some of the alloys the acid acts slowly, with evolution of hydrogen and sulphurous acid, whilst on others it acts rapidly, with development of sulphuretted hydrogen, sulphurous acid, and hydrogen, and with separation of sulphur. The reaction is greatly affected by the proportion of metals in an alloy of the constituents, by the purity of the acid, and by the temperature at which the experiment is made. He finds that the presence of small quantities of antimony and copper in lead increases the resistance of the metal to the acid, whilst the presence of bismuth renders it more susceptible to attack.

Votes by the Privy Council Office for Auxiliary Scientific Investigations during the years 1871-1874 have amounted to £8,000, out of which £3,870 only has been expended. The subjects investigated have been Infective Inflammations and the Febrile Process. Under the former head, four reports have been made, viz., two, by Dr. Klein, on Lymphatic System and its Relation to Tubercle; one, by Dr. Sanderson, on the Infective Products of Inflammation; and Provisional Reports, by Dr. Thudichum, on Chemical Changes in Cases of Typhus. Under the second head rank a report, by Dr. Klein, on the Pathology of Sheep-pox; a report, by Dr. Creighton, on Anatomical Research towards the Ætiology of Cancer; a report, by Dr. Thudichum, on the Chemical Constitution of the Brain; and a report, by Dr. Sanderson, on the Pathology of the Infective Processes. Most of these reports will be found appended to the report of the medical officer of the Privy Council, dated 30th of July, 1874. Further reports, on the same important investigation, will shortly be laid before Parliament.

EXHIBITION OF APPLIANCES FOR THE ECONOMY OF LABOUR AT MANCHESTER.

After several visits to this exhibition, now being held at Cheetham Hill, Manchester, in a commodious wooden building constructed for the purpose, we find much to admire and little to blame in the arrangements there made, whether for the convenience of exhibitors or visitors. In short, we cannot help appreciating the praiseworthy efforts of the Society for the Promotion of Scientific Industry to provide an exhibition, having specially this object in view, viz., showing what advance has been made in the mechanical world in the way of tools or appliances for the economy of labour.

In an exhibition of this kind, we necessarily find exhibits of two distinct classes: Firstly, well-known and long-tried tools or appliances, having certain improvements in detail, design, or workmanship; and, secondly, entirely new tools, which are for the most part untried, but which bear on the face of them certain attractiveness of notice, favourable or otherwise. We also sometimes find a third or intermediary class, which seems to form the connecting link between the other two.

All these classes are fairly represented at the exhibition at Cheetham Hill, which consists of—as befits a Manchester mechanical display—a fine collection of lathes of various kinds, planing, slotting, shaping, drilling, punching, shearing, and forging machinery, hydraulic and other cranes, hoists, screw-jacks, machine and hand tools, used by carpenters and joiners for planing, morticing, and moulding;—some dressing and cutting machines, and various appliances for boring into rocks, together with the usual miscellaneous filling in, domestic and otherwise, without which no exhibition seems to be complete.

As a specimen of splendid workmanship, perhaps the breech-loading field-gun and carriage, exhibited by Sir Joseph Whitworth and Co., Limited, stands pre-eminent. A very useful tool is shewn by Selwig, jun., and Co., for drilling slots in shafts, as it can be used upon shafts mounted in their bearing. Hey's wheel moulding machine seems to us to be nothing different from that of Scott by its side, except in the details, which appear certainly more mechanical in form; but whether it will be more successful than the one it is intended to supplant, is difficult to determine, except by experience.

The screwing machines exhibited by Kendal and Gent appear to be capable of doing a good amount of work, as also the planing machine shewn by Brookes, Roberts, and Co.

Amongst the lifting appliances, we notice a model machine for raising scaffolds, which certainly is somewhat novel in character, but which, we think, would be found in practice too expensive, and also difficult, as well as limited in application on a practical scale.

Some very excellent work in this department, connected with hydraulic presses, is shewn by Edward J. Bellhouse and Co.

One of the most interesting illustrations of economy of labour in the exhibition is Messrs. Elkington's collection of appliances for plating and gilding by means of electricity; and, as the same are from time to time put in operation, this exhibit has become very popular amongst the visitors.

Mr. John Petrie's wool scouring machinery, although well known, is worthy of special notice.

Noticeable domestic appliances are an improved step ladder, shewn by Fallows and Bates, which, if generally used, would prevent those numerous accidents arising from the incomplete distending or improper fixing of the step ladder in ordinary use. A very ingenious contrivance is also shewn by Mr. Henry Grimshaw, to whom those ladies who are fond of embroidery work ought to be eternally grateful, for by this means they can be enabled to properly stamp with the desired pattern their own materials at the cost of a few pence. The patterns are printed on thin paper in a compound; which, when placed on the fabric, and pressed with a hot iron, leaves a print or impression on the cloth.

Mr. Charles Harris exhibits a machine for making paper bags, which cuts the paper, folds, pastes, presses, dries, and delivers the bags complete without any assistance on the part of the attendant. Another novelty is shown by Mr. W. Roberts, being a machine for painting the laths or strips of wood composing venetian blinds, and is certainly very expeditious, and simple in its action.

A great variety of domestic fire grates are shown; but these, for the most part, are similar to those exhibited last year, some of which, however, hardly fall within the category of labour saving appliances. Harrop's tin-lined lead water pipes for the prevention of lead poisoning, if not strictly a labour saver is a health saver, and the result of a very ingenious labour saving machine, and if the use of such pipes for water could be made compulsory, a great sanitary reform would certainly be effected.

A new and useful invention is shewn by Fallow and Bates (Goldstein's patent), in the form of a combined ash-pan and cinder-sifter, whereby the ashes are separated from the cinders as they fall, and are collected in two separate drawers, extending underneath the fire, either of which can be removed without disturbing the ash preventor in any way. This will commend itself to the kitchen-maid, as it dispenses with the labour of sifting, either by hand or machinery.

A great number of educational appliances are also shewn, which are well worthy of inspection and study. These, together with the mechanical toys and the diving tank and apparatus, form an array of objects, which is in no way inferior to that of last year, and, in many respects, superior thereto. It is to be hoped the society will be encouraged by the public of Manchester and vicinity to persevere in the good work they have commenced, and that each year may bring a decided improvement upon the one preceding it.

In the preparation of the foregoing report of this Exhibition, held by the Society for the Promotion of Scientific Industry, we have to acknowledge the assistance of Mr. W. Gadd, C.E., of Manchester, who so ably reported on the exhibition held by that Society last year.

Cornelius Varley.—A few of the water-colour drawings and oil pictures of the late Cornelius Varley (so long an active member of the Council of the Inventors' Institute), who was the last survivor of the original founders of the Old Water Colour Society, were sold by Messrs. Christie last week. We understand, however, that the principal works of this painter are still in the hands of his family, who are desirous of disposing of them as a whole. Mr. Cornelius Varley was a brother of John Varley, a well-known artist. We were particularly pleased with a set of etchings of "Barges, Fishing Boats, and other vessels," drawn from nature, and etched by Cornelius Varley, and published by subscription by the brothers in 1809. We should be glad to see some plan carried out for widely distributing the paintings of our late revered friend.

The St. James's Magazine and United Empire Review.—Moxon.—This serial still continues to sustain its high reputation.

The Electrical News and Telegraphic Reporter is the title of a new weekly, edited by William Crookes, F.R.S. We commend it to the notice of all interested in electrical matters.

APPLICATIONS FOR LETTERS PATENT.

April 9th, *Continued from page* 114.—J. Worrall. Apparatus for colouring pile fabrics.—J. Kaye. Means or apparatus employed for registering the locking or unlocking of locks.—D. Spill. Lathes for turning buttons and similar articles.—R. N. Allen and A. B. Pullman. Construction of railway wheels.—T. W. Wilson. Apparatus for extracting corks from bottles.—T. W. Wilson. Bottle brushing apparatus.

On April 10th.—1300 to 1317.—R. Parker. Distributing manures, and the machinery or apparatus employed therefor.—H. Conradi. Arrangements for making coke from peat (com.)—D. Smith and G. Tolson. Extracting vegetable matters from combinations of animal and vegetable substances.—J. Smith. Apparatus for subjecting printed or other fabrics to the action of steam.—A. Crabtree. Construction of machines known as "middlings separators" or purifiers.—C. D. Abel. Treatment of oak and other wild silks for bleaching and dyeing (com.)—E. C. F. Otto. Steam-engines.—A. A. Croll. Treatment of sulphur ores.—E. Bennis. Mechanically feeding furnaces with fuel, and apparatus connected therewith.—H. Hunting. Machinery for manufacturing puddlers' rabbles and paddles.—W. H. Willis. Construction of safety envelope. A. Hughes. Apparatus to be applied to reaping and mowing machines for lifting laid crops. (Complete specification.)—J. Owen and T. S. Binns. Construction of chains by which they are rendered applicable to various useful purposes to which they have not hitherto been applied.—W. R. Lake. Engines worked by heated atmospheric air (com.)—J. S. Stevens. Garden engines.—J. Norris. Method of actuating or giving motion to washing machines and churns.—M. L. B. de Longagne. Steam boilers or generators and their furnaces.—G. Haseltine. Machines for cutting match-splints and preparing them for being dipped in the igniting composition (com.) (Complete specification.)

On April 12th.—1318 to 1328.—W. F. C. S. Corry. Manufacture of aerated waters, and apparatus and vessels therefor.—W. Walker. Axle-bearings for tubs or waggons used in mining operations and the like.—J. Clarke. Railway breaks.—G. A. Clough and C. Ridealgh. Puddling apparatus.—C. H. James and A. J. Hamilton. Manufacture of felted articles, and the machinery or apparatus employed therein (com.)—H. Gaskell. Manufacture of alkali.—F. X. F. Heilborn. Spring earring.—S. Batt and T. Batt. Chimney tops for the prevention of smoke.—R. Steers. Screw heads and drivers or tools for the same.—P. Lombardon. Manufacture of candles.—F. W. D. Steinfelser. Manufacture of concertinas, organs, and harmoniums.

On April 13th.—1329 to 1342.—T. W. Wilson. Bottle crate.—H. C. S. Dyer. Manufacture of gun barrels, and apparatus therefor.—R. Cowper. Kaleidoscope.—E. Deakin. Propellers, and the arrangement and positions of same for navigable vessels.—J. Lillie. Apparatus for regulating, measuring, and registering the flow of liquids.—F. A. R. Fenton. Mode of treating or preparing natural flowers, leaves, and other parts of plants for ornamental or decorative purposes.—W. Morgan-Brown. Treatment of sewerage with a view of extracting the fertilising products therein contained, and the apparatus employed for that purpose (com.)—E. H. Huch. Tempering flat and shaped glass, and furnaces to be employed therefor.—J. Teychenné. Apparatus to be used in disinfecting linen and bed clothes, and the walls, ceilings, and floors of rooms, and for other like purposes.—P. Jensen. Production of glass for rendering it harder and stronger (com).—J. Turner. Velocipedes.—J. Summers. Manufacture of nails or spikes.—J. Cure and C. Bradley. Machinery for combing wool, cotton, silk, and other fibres.—J. G. Tongue. Lamp burners for burning petroleum and other mineral or vegetable oils (com.)

On April 14th.—1343 to 1361.—V. Felice. Method for removing the incrustation from boilers of steam engines, for prevention of successive incrustations and for the preservation of the metal.—E. Shaw. Wheels to be used for winding and driving purposes.—W. H. Woodcock. Damping rollers and other apparatus for lithographic printing presses.—J. Paris and J. Adam. Packing cases or receptacles for bottles and jars.—T. J. Chapman and H. B. Fox. Apparatus for bottling aërated or gaseous liquids.—E. Harvie. Methods of applying spiral springs to carriages for the purpose of more easily raising and lowering the heads of the same, and the application and use of a new screw head fastening for the same purpose.—J. Collier and J. Marsden. Looms for weaving.—W. W. Macvay. Tank furnaces or apparatus for the smelting or manufacturing of glass and other materials.—R. Davison. Machinery or apparatus for breaking or treating flax and similar textile materials.—A. K. Irvine. Compressing and serving or binding tobacco or ropes, cables, or similar articles, and apparatus therefor.—W. J. Ingram. Printing machinery.—F. Cook. Pen and pencil cases and other similar articles.—M. Trentanove and J. Verdie. Stopping railway trains in quick transit, and thereby avoid collisions or other dangers ahead of the trains.—P. J. S. Harlow. Hames for horses and other draught animals.—H. H. Murdoch. Sewing machines (com.) (Complete specification).—F. Goddard and E. Massey. Hot-air heating apparatus.—F. Wirth. Steam fire-engines (com.)—W. H. Woodcock. Printing machinery.—G. Haseltine. Harvesting machines (com.)

On April 15th.—1362 to 1382.—E. Edwards. Method of printing from plates of gelatine or equivalent material.—F. J. Money. Construction of brakes for railway carriages.—J. Harrington. Chess and draught boards.—H. Illingworth. Apparatus employed in spinning and twisting worsted and other yarns.—P. Kelly. Apparatus employed in preparing and combing wool and other fibres.—B. Harries. Guaging, and to prevent waste in a continuous supply of water for flushing closets, domestic, and general (or other) purposes.—T. Spencer. Purification of water and other fluids.—D. P. Wright. Petroleum or hydrocarbon cooking stoves.—P. Jensen. Solid brick for the construction of hollow walls or arches (com.)—H. C. Mayer. Instrument to be employed in slaughtering oxen, horses, and other animals.—T. Lund, J. Gregg, and W. H. Marks. Machinery or apparatus for the manufacture of tubes of paper, linen, or other materials.—B. L. Thompson. Protecting or preserving ships or vessels and other submerged or partially submerged structures.—J. Howard. Apparatus for supplying disinfectants for disinfecting water-closets, and for other purposes.—H. M. Burton. Apparatus for cutting up loaf sugar.—J. Curlender. Preparation and manufacture of biscuits and such like and other articles of food.—F. Wirth. Breech-loading fire-arms (com).—A. Greenwood, J. Keats, and A. Keats. Sewing machines.—W. L. Hosking. Sticks and staves used by pedestrians and other travellers.—F. A. Jacquet. Apparatus for burning petroleum and other liquid hydrocarbons suitable for heating purposes.—J. Coward. Construction and arrangement of brick and tile making machines.—F. Wirth. Bleaching fabrics, yarns, fibres, paper pulp, and other articles (com).

On April 16th.—1383 to 1400.—A. Porter. Watch pockets, and the manner of attaching the same to vests for protecting watches.—E. Beech. Machinery for printing.—G. S. Hare and W. Barton. Self-acting lubricators.—R. G. Elwes. Adaptation and application of slate for pavements, steps, landings, street crossings, and other similar uses.—J. Kaye, W. C. Slingsby, and W. Leigh. Oil cans or oil feeders.—J. T. Walton. Machinery or apparatus for cutting the threads of screw bolts, nuts, and other articles.—S. H. Greaves. Manufacture of knives and forks.—J. D. F. Hald. Machinery for cutting cork stoppers (com.)—W. W. Barton. Construction of cultivator.—G. E. Illingworth. Lathes.—C. Brakell. Obtaining and applying motive-power, also applicable as fluid meters.—G. Sonnenthal. Apparatus for locking doors of railway vans and trucks, goods, carriages, or warehouses (com.)—J. A. Mason. Washing machines.—J. Barnett and B. Zieschang. Cartridges for breech-loading fire-arms.—H. H. Murdoch. Treating and utilizing spent tan and obtaining useful products therefrom (com.)—P. Puchan. Apparatus for collecting, elevating, and depositing agricultural or other produce.—C. H. Stearn. Apparatus for detecting counterfeit coin.—E. Putnum. Spring rollers for window blinds.

On April 17th.—1401 to 1414.—W. West. Compressing, storing, and utilising air and other fluids, and apparatus therefor.—J. A. Bowles. Roller skates.—J. A. Bowles. Roller skates.—W. C. Henderson. Treatment of that preparation of india rubber commonly called vulcanite.—R. Hodgson. Apparatus used in forming the heads of wood casks.—J. Green. Machinery or apparatus for cutting or excavaing by steam power, ditches, channels, or trenches in land for the purpose of draining it, partly applicable as an improved means of regulating the coiling or winding of wire ropes upon drums.—J. G. Rollason and J. Wood. Fastenings for solitaires and sleeve links, which are also applicable for connecting dog-collars, satchels, and for other purposes.—E. Wolstencroft. Self-acting temples for looms and machines for stretching, drying, finishing, and printing fabrics.—J. Aubin. Machinery for cleaning or purifying flour leaving bolting houses.—B. W. Clegg. Machinery or apparatus, engine stroke indicator for registering the number of strokes per minute, per day, and per week of any description of engine or other machinery to which it may be applied.—C. H. Southall. Machinery for brushing and polishing boots and shoes.—T. H. Gray. Mode of and apparatus for treating fibres for the manufacture of paper.—D. A. W. Koning. Pneumatic pontoon deck.—C. T. Colebrook. Steam and other engines.

On April 19th.—1415 to 1428.—R. Atkin. Prevention of deviation in the mariners' compass.—L. von Wojewodsky. Means for facilitating the transit of wheel carriages on roads.—G. A. Clough. Steam-engines.—J. H. Johnson. Knitting-machine needles (com.)—I. Steiner. Treating blood for agricultural and other purposes.—F. Haden. Cartridge case for breech-loading fire-arms.—P. Jensen. Manufacture of nuts ready for tapping, and of similar objects, and apparatus therefor (com.)—G. Ritchie and J. G. Ritchie. Mode of and apparatus for producing quilted fabrics or manufactures.—W. E. Newton. Apparatus or mechanical arrangement for illustrating the rotation of the earth and the parallel motion of its axis line, also the position of lines of light and heat and of the plane of observation in known parallels of latitude (com.)—S. Diplock. Apparatus for ascertaining the temperature of fluids contained in pipes, boilers, or other closed vessels.—J. Bear. Apparatus to be used in the manufacture of cigars.—F. Bennett. Producing patterns or designs in metals on cloth or fabrics.—J. Oldroyd and T. H. Blamires. Manufacture of waddings and felted fabrics for carpets and other purposes.—F. Bennett. Printing cloth or other fabrics.

On April 20th.—1429 to 1442.—C. Lucop. Machinery for grinding and pulverising seed, grain, ore, and other substances.—H. Dickie and J. Dickie. Machine for thinning turnips and other plants.—J. Jaap. Advertising.—S. G. Rhodes, M. Shillito, and J. I. Speed. Finishing yarn and threads, and apparatus connected therewith.—C. D. Abel. Manufacture of flapped axles and apparatus therefor (com.) (Complete specification.)—T. B. Doolittle. Conductors' hand alarms, and registers, and means of supporting the same on or in the hand. (Complete specification.)—A. Moncrieff, L. Gye, L. N. Moncrieff. Double-barrelled guns and rifles to facilitate aiming therewith.—W. Gray. Beaters for thrashing machines.—L. Brumleu. Production of white-lead.—F. P. Warren. Manufacture of boots and shoes.—A. V. Newton. Mode of and apparatus for filling sugar moulds and treating sugar in the moulds (com.)—W. E. Newton. Construction of water meters (com.)—J. A. Stockwell. Construction of vessels for saving life at sea, and the apparatus for launching the same.—H. Kinsey. Machinery for preparing, moulding, and pressing artificial fuel, peat, clay, and other similar materials.

On April 21st.—1443 to 1464.—W. Wadsworth. Manufacture of tape ladders for venetian blinds and apparatus employed in such manufacture.—R. Collins, D. Longsdon, and J. W. Murray. Construction and arrangement of trading or passenger ships, the construction of show cases or stands to be adapted thereto, and the means of raising and lowering the same.—W. Russell. Melting brass or cast iron by means of a furnace to be constructed of brick and iron instead as heretofore by a crucible.—G. R. Holding. Scissors and shears sharpener.—E. H. Bayley. Water carts or waggons, which may also be used for other purposes.—J. M. Wilders. Self-acting guard for steam thrashing machines.—J. Kitson. Method of and apparatus for sweeping streets.—D. La F. Chase. Steam governors. (Complete specification)—T. Hyatt. Treatment of certain chemical compounds for the purpose of rendering the carriage, sale, use, and application more convenient and economical.—D. Longden. Construction of sheep shears.—W. N. Bryett. Iron chair bedsteads.—A. Macdonnell. Machinery for washing bottles and similar vessels. P. Spence. Manufacture of manure from certain mineral phosphates.—A. V. Newton. Mechanism for embroidering and braiding (com.)—A. V. Newton. Apparatus for tentering, straightening, drying, and finishing cloth and other fabrics (com.)—C. Kingsford. Manufacture of artificial fuels.—J. T. Parlour. Apparatus for opening and closing windows.—C. E. Hall and C. E. Bainbridge. Machinery and apparatus for kneading, cutting, condensing, drying, carbonizing, and disintegrating or pulverizing peat and other matters.—W. L. Wise. Apparatus for tying knots (com.) (Complete specification.)—J. H. Johnson. Apparatus for supplying water to steam boilers and similar receptacles (com.)—D. E. Wymer. Abdominal belts.—A. M. Clark. Traction engines (com.)

On April 22nd.—1465 to 1485.—W. Cox. Treating yarns when wound into cops or analogous forms for use in sewing machines.—P. Denniston. Compound or substance to be used for preserving iron and wooden ships, and which may also be employed for rendering wooden partitions and beams in buildings less inflammable.—A. J. Higham. Clocks and other timekeepers.—P. Jensen. Tube wells (com.)—H. Conradi. Arrangement for shaping bolt or screw heads and nuts from under one quarter of an inch to over one inch and a half in diameter (com.)—J. Olivier. Brakes for railways.—F. G. Morton. Mode of and apparatus for treating tin plate scraps or clippings and waste articles made of tin plate, such as meat tins and the like.—E. T. Hughes. Breech-loading fire-arms (com.)—J. S. Holmes. Construction of shirt studs, which are also applicable to studs used for other purposes.—B. Wade. Combined pipe case, tobacco stopper, and pipe brush.—R. Winder. Horseshoes.—J. G. Tongue. Screws and screwdrivers (com.)—J. G. Tongue. Manufacture of corks or stoppers and machinery or apparatus employed for this purpose (com.)—J. R. Hodgson and T. W. Sweet. Life buoys, boats, pontoons, or floating apparatus suitable for being employed for rescuing persons in case of shipwreck or disaster at sea, applicable to various other like useful purposes or for transport use across land, river, and sea.—G. Haseltine. Device for holding braided and other thread and the like (com.) (Complete specification.)—T. Whitehead and I. Best. Noble's and other combing machines.—J. Apperly. Steam boilers.—H. E. Newton. Blast furnaces for smelting iron and other ore (com.)—G. Greig. Straw elevators.—J. H. Johnson. Manufacture of manure and the apparatus employed therein (com.)—A. W. Pike. Apparatus for preserving life and property afloat, parts of which apparatus are also applicable to navigation and other acquatic purposes.

On April 23rd.—1486 to 1507.—C. Myring. Apparatus for the prevention of the slipping of horses in frosty weather or on slippery pavements.—R. H. Courtenay. Electro-magnetic motor.—T. Miller and N. Jamieson. Manufacture of curtains.—E. E. Pearse. Manufacture of glucose or grape sugar from rice or other grain.—C. Williamson. Conveyance of carriage, specially applicable for funeral purposes.—C. Willis and W. Pearson. Double-acting pumps and pumping-engines for feeding steam-boilers, and other purposes.—W. F. Woods. Apparatus for drawing oil and other liquids from vessels containing the same.—F. G. Wynne. Railway signalling, and apparatus therefor.—R. Budge. Apparatus for raising water and other liquids (com.)—R. Budge. Heating and condensing liquids (com.)—L. Hirschfield. Machine for binding and bordering bonnets, hat-shapes, and other similar purposes.—W. Cooper. Apparatus to be used for designing or setting out the slide valves of steam engines, and for indicating the working of such valves.—C. Eskrett. "Wrappers" employed in the manufacture of seed or oil cake.—W. P. Buchan. Ventilating the soil and waste-water pipes and drains of houses, and the construction and fitting of water traps or apparatus for the said purpose. —W. Reid. Sewing machines.—W. Cook and S. Hall. Rendering tallow.—J. Brock. Manufacture of perforated blocks of chloride of sodium or chloride of potassium for use in the manufacture of sulphate of soda and sulphate of potash.—C. Causley. Manufacture of extending trellis-work, and apparatus therefor.—H. L. Page. Studs for collars, wristbands, belts, and other articles of wearing apparel, such improved studs being also applicable to other purposes.—H. W. Cook. Purification of carburetted hydrogen gas.—J. Middleton. Sink and other traps. —F. Shanks. Carriages. (Complete specification.)

On April 24th.—1508 to 1517.—S. H. Musgrave. Method of applying composition to handles for forming skin rasps for the hands.—R. Young and T. Thomson. Tools or apparatus for planing or shaping stone and similar hard substances.—D. M. Yeomans. Obtaining and applying motive-power, and the machinery or apparatus employed therein.—B. Rhodes, T. B. Rhodes, and J. B. Stoney. Machinery or apparatus employed for washing woollen or other woven or felted fabrics, also for stiffening and staining the same.—J. J. Aston. Paddle propellers.—J. C. Merryweather, H. Merryweather, and C. J. W. Jakeman. Locomotives and carriages to be drawn thereby, and the mode of increasing the adhesion to the ways of the wheels of such locomotives when used for drawing other vehicles, parts of which improvements are applicable also to other purposes.—H. A. Bonneville. Means of preventing the breakage of the glass chimneys of gas burners or lamps and glass vessels of petroleum lamps, and the accidents resulting therefrom (com.)—J. E. Lawrence and E. V. Porter. Combined engines and centrifugal pumps. — W. J. Spurrier. Apparatus for warming and ventilating.—G. W. Dawson. Additions to seals for chains, bars for chains, lockets, and charms, which improvements or additions may also be applied to watch keys.

On April 26th.—1518 to 1532.—G. Thornley and T. Buxton. Machinery used in jointing or edging wood staves for the manufacture of casks. (Complete specification.)—A. H. Byng. Animal trap.—F. Chevallier. Sample box for all kinds of liquids, offered to the public under the name of "patent safe-packing sample boxes." —W. Walcker. Desk-tables for the use of bedridden persons.—S. Alley. Apparatus to be used in removing submarine rocks.—J. P. Kerr. Machinery for winding sewing thread.—W. Swift. Manufacture of railway wheel tyres, parts of which are also applicable to other purposes.—H. Fellinger. Apparatus for catching or collecting flies, wasps, bees, or other insects (com.)—J. Monks. Apparatus for shaving the face or other parts of human body, also applicable to other shaving or cutting purposes.—H. A. Dufrené. Apparatus for locking or fastening (com.)—H. B. Barlow. Apparatus for heating the feed water of steam boilers (com.)—T. Henderson. Furnace grates, and modes of and apparatus for actuating the same, so as to stir the fire and in some cases make the furnace self-cleaning.—J. Turnock. Cooling or refrigerating wort and other liquids.—J. W. Woodford and E. G. Woodford. Machinery for raising and forcing water or air, and for dredging mud, sand, and deposits in general from river beds, docks, and harbours.—W. L. Wise. Apparatus for feeding steam boilers with water (com.)

On April 27th.—1533 to 1549.—W. R. Lake. Method or process of treating jute, gunny, manilla, and other fibrous materials for the manufacture of white paper and for other like purposes (com.)—F. Durand and E. L. Marais. Apparatus for pressing or moulding bricks and other agglomerated articles of like kind. (Complete specification.)—H. G. L. Crichton. Military saddles and numnahs.—K. W. Hedges. Steam-boilers.—G. Briggs and H. Stead. Singeing woven fabrics and yarns.—J. W. Kenyon. Low-water alarm whistles or detectors for steam generators.—G. Plant. Steam generators, and the formation of the internal flues of the same.—L. Knoblaugh. Brakes and signalling apparatus of railway trains (com.) —L. Knoblaugh. Railway signalling apparatus (com.)—P. Samain. Rotatory engine.—F. J. R. Carulla. Casting ingots, and apparatus in connection therewith.—J. Catherall. Cowl for preventing downward draughts in chimneys.—C. D. Abel. Apparatus for heating air or other gases (com.) (Complete specification.)—T. K. Hattersley. Steam engines.—J. W. Clayton. Manufacture of waterproof packing paper and cloths or fabrics.—H. Jewett. Reflectors for lamps and other like purposes (com.) J. Young. Manufacture of waterproof and airproof fabrics.

On April 28th.—1550 to 1565.—M. A. Dearden. Attaching curtains, valances, and other trimmings to metallic or wooden bedsteads and other articles of furniture.—C. W. Siemens. Construction and working of glass-melting furnaces.—F. Watt. Preservation and safety of sheet music when carried in portfolios.—W. E. Gedge. Manufacture of plates, slabs, or tiles, in imitation of the ware known as "Faience Parisienne" (com.)—H. Defries. Manufacture of glasses for railway carriage roof lamps.—R. H. Simons and A. Martin. Apparatus for clipping and shearing horses, sheep, and all other animals with one or with both hands, and by mechanical power.—W. A. Gilbee. Safety shoes for railway carriages (com.)—J. B. Hilliard and J. Watson. Skates.—B. Hunt. Manufacture of sugar from sugar canes and apparatus to be employed therein, which apparatus is also applicable for other like purposes (com.) —L. G. Rodel, J. Masse, and W. Webster. Carriages, tricycles, or other vehicles propelled by treadle and manual motion.—C. D. Goubet and J. N. Monrocq. Machinery for transmitting motive power.—J. Nelson. Drilling machines.—T. P. Allen. Manufacture of metal tubes.—D. Greig. Apparatus for cultivating and tilling land.—A. Bilbrough. Locks or fastenings for carriage doors.—W. J. Hinde. Self-acting bolt or catch.

On April 29th.—1566 to 1588.—R. Hattersley. Composing and "justifying" printers' type, and mechanism and arrangements to be employed therein, and also arrangements and mechanism for distributing printers' type ready for hand or machine composing.—W. Payton and J. E. Holmes. Engines to be actuated by steam, air, or other fluid, also applicable for raising and forcing liquids.—J. Holding. Looms for weaving, and temples to be employed in connection with such looms. —J. Nicholas. Apparatus for indicating the levels of water or liquid in reservoirs, ships' holds, steam generators and other places.—E. Breeston. Apparatus for cracking nuts, and similar useful purposes.—J. Dadswell. Apparatus for producing a duplicate of patterns designs, or manuscripts.—W. Corfield. Apparatus for extracting or exhausting foul or heated air or vapours from ships, mines, buildings, and other such like purposes.—E. Salt. Apparatus to be used for the manufacture, colouring, veneering, and enamelling of paper and paper cloth and such like materials.—F. Erskine. Fire-bars, and the construction of steam-boiler and other furnaces for the consumption of smoke and economisation of fuel therein.—W. Harrison. Sewing machines and other appliances connected therewith. — J. Hargreaves and T. Robinson. Apparatus or appliances employed in the manufacture of sulphates of soda and potassa.—D. Baker. Mariner's compass. (Complete specification.)—A. C. Adam. Paving.—J. A. Guivet. Rectilinear sewing machine for hosiery.—C. Fournier. Special tools for imitating the porosity of wood in decorative painting.—B. Goddard. Taps or valves.—H. Oram. Construction of sewing machines.—A. Chalk and W. Chalk. Method of combining wrought iron and cast iron, which method is also applicable to the combination of other wrought and cast metals.—C. A. Martius. Dyeing or printing.—J. B. Hamilton, G. E. Wade, R. W. Ok-s-Voysey, and A. J. Balfour. Construction of stringed musical instruments.—W. Heath. Sewing machine needles.—A. M. Clark. Developing and fixing colours on fabrics (com).—A. M. Clark. Cake-making machinery (com).

On April 30th.—1589 to 1606—J. A. Clarke. Propelling tillage implements by steam or other motive-power, and the construction of such implements. — W. H. Taylor. Trimming for skirts and other garments for female wear.—W. Haggas and J. Haggas. Looms for weaving, and apparatus connected therewith.—W. F. Wheeler. Device (to be applied to a conduit or pipe) for holding a concentrated fertilizer or other soluble compound in a solid or semi-solid form. (Complete specification.)—H. Brooks. Bottles and other vessels to hold liquids, and means applied thereto to facilitate the discharge of liquids therefrom.—J. H. Rogers. Manufacture of nuts, washers, and other similar articles. —E. T. Hughes. Treating slag from blast furnaces (com.)—E. T. Sykes. Machinery or apparatus to be used for feeding carding engines. —R. Wappenstein. Apparatus to be used for registering the number of persons entering and leaving omnibuses, tramway cars, theatres, and similar places.— T. Sutcliffe and J. Fewings. Construction of bottles and their stoppers for containing aerated liquids.—J. G. Jennings and A. W. Pocock. Liquid meters.—G. F. Parratt. Life rafts.—J. F. Winkler and A. A. Zeidler. Wood-moulding machines.— W. C. Kritch and A. Greenwood. Printing machinery. —J. Howard and E. T. Bousfield. Furnaces for metallurgical and other processes. — A. M. Clark. Manufacture of red sulphide of mercury (com.)—R. R. Holben and J. P. Fison. Feeding apparatus for thrashing machines.—C. L. Travis. Machines and band for binding grain.

On May 1st.—1607 to 1623.—A. B. Brown. Hydraulic machinery for punching, planing, shaping, rolling, and rivetting boiler-plates.—A. Martin. Apparatus for capsuling bottles or other articles for which capsules are or may be employed.—F. W. Nedler. Apparatus for counting and registering the time occupied, the distance travelled, and the fares in cabs and other vehicles.—N. Wilson. Sewing machines. —W. March and R. Dalgliesh. Guarding and locking points for railways, and apparatus for that purpose.—E. Stevens. Connection for tightly coupling or uniting the actuating chains or rods of the brakes of railway vehicles or carriages so as to make the said actuating chains or rods continuous, which improved connection is also applicable to other similar purposes.—W. R. Lake. Writing desk or table (com.)—J. Kidder. Ball castors and balls for locomotive purposes generally.—A. M. Clark. Process and machinery for making the heads of chain swivels (com.) (Complete specification.)—J. Edwards. Means and apparatus for bottling and drawing off liquids.—S. Heeley. Apparatus for coupling railway trucks and other carriages. —J. J. Ashworth and G. Ashworth. Machinery for warping.—B. Haigh. Waterclosets.—A. M. Clark. Production of aniline black for printing and other purposes, and in dyeing aniline black (com.)—B. Haigh. Cocks or valves.—H. J. Raymond and A. Migotti. Padlocks.—Sl. Roberts and Sr. Roberts. Manufacture of driving straps or belts, and "picking arms."

On May 3rd.—1624 to 1643.—T. Gratton and J. Beal. Construction of locomotive and traction engines.—T. Pape. Filtering and deodorising sewage so as to prevent rivers being polluted thereby.—R. W. Rhames. Gas burners.—S. A. Hannen. Recreative game of targetier, for in or out-door exercise and amusement.—G. A. Robinson and W. J. Kendall. Construction of brakes for railway carriages and other rolling stock and tramway cars —T. Coltman. Machinery or apparatus employed in the manufacture of looped or knitted fabrics.—S. Carlton. Construction of tire fastenings. — S. Russell. Fire-grates.—H. Deacon. Manufacture of chlorine.—E. P. Alexander. Railway brakes (com.) (Complete specification.) — H. E. Newton. Construction of moveable grate, applicable to various kinds of fire-places or furnaces (com.)—F. H. Varley. Machinery or apparatus for moulding or forming discs and other forms in metals and other materials.—C. Hessel. Construction of steam boilers (com.) (Complete specification.) — F. Siemens. Hardening, tempering, and pressing glass, and apparatus therefor. — E. Sonstadt. Manufacture of sulphuric anhydride.—A. M. Clark. Locking screw nuts (com.) (Complete specification.)—G. Haseltine. Improved cork-screw (com.) (Complete specification.) — F. Wirth. Fire-engine locomobiles (com.) — G. H. Lomax. Lamps. (Complete specification.) — G. E. Brown. Apparatus for gathering and binding cut crops.

On May 4th. — 1644 to 1665. — P. Boyton. Floating garments or costumes and means of propulsion therefor.—F. J. Money. Construction of brakes for railway carriages.—R. H. Courtenay. Production of steam power.—L. Jacob. Solitaires, sleeve, and other studs, and other like fastenings and ornaments.—C. Randolph. Machinery for moulding and compressing bricks or blocks of asphalt, clay, or other materials.—J. Booth and J. Banks. Construction of crank arms used in looms for weaving.—C. Richardson and W. H. Beck. Pneumatic looms for weaving.—G. Dyer. Fire-bars for kitchen ranges, kitcheners, drawing-room, and other stoves, and moveable and fixed backs applicable thereto.—J. R. Harper. Inhaling, disinfecting, and ventilating apparatus, applicable also to medicated and vapour baths.—M. J. Hart. Manufacture of handles for tea pots and other like purposes.—A. C. Henderson. Obtaining and applying motive power (com.)—R. M. Caffall. Apparatus for containing compressed or liquefied gases for the speedy extinguishing of fires, inflation of life-saving appliances, and other useful purposes.—J. Level. Apparatus or instruments for teaching and demonstrating metrical system.—W. Walker. Rock drilling machinery.—R. R. Gubbins. Blowers and portable and other forges.—F. Trier. Mode of and apparatus for preparing moulds for producing stereotype plates for letter press printing.—C. P. N. Weatherby. Construction of seats and seat backs for chairs, sofas, couches, carriages, and other purposes (com.)—T. Williamson. Dredging or excavating apparatus or mechanism.—W. P. Buchan. Waterclosets.—J. H. Johnson. Photography (com).—J. G. Butler. Button fastener or fasteners.—R. W. Hutchins. Producing ceilings of plaster or cement.

On May 5th.—1666 to 1681.—J. L. Vispe and A. F. H. Nisbeth. Means of communicating between railway trains and any station or other part of the line of railway and vice versa (com.)—J. Hopkinson. Grease purification.—M. A. Wier. Apparatus for indicating and registering the speed of machinery and other moving objects.—W. H. Hacking and T. Hacking. Machinery for weaving and folding cloth.—T. J. Smith. Fusible boiler plugs for preventing explosions of, or other injury to, boilers through a deficiency of water.—T. Wallis. Manufactory of lace.—J. Whitley. Mode of and arrangements for removing from sewers and dealing with deleterious gases.—J. A. Turner and J. T. Stoneham. Material for covering or packing articles, and the process or apparatus for manufacturing the same.—M. I. Landau. Miners' safety lamps and other lamps and apparatus for lighting, also apparatus for heating and cooking, ventilators, and tops, caps, or windguards for chimneys.—A. V. Newton. Construction of elevated railway (com.)—H. E. Newton. Rotary engines (com.)—G. Haseltine. Paddle-wheels, and machinery for operating and adjusting the same (com.) (Complete specification).—W. Stroudley. Method and arrangement of fastening and securing tyres upon iron wheels.—T. A. Mathewson. Spooling machines (partly com.)—J. Deere. Manufacture of artificial fuel.—J. F. Boetius. Hydraulic cranes.

On May 6th.—1682 to 1694.—M. Gandy. Construction of railway wheels.—J. Bacon. Hydraulic oil pressing machinery.—E. W. Roxby and T. Walker. Taking-off apparatus for lithographic and letter press printing machines. H. Leadbetter. Non-conducting compositions for preventing the radiation or transmission of heat or cold.—T. Cope. Cigarettes.—J. Huxtable. Turn-wrest ploughs, applicable to single furrow, double furrow, and triple turn-wrest ploughs.—B. J. B. Mills. Excavating machines (com.)—J. Young. Measuring and indicating the distance travelled over by vehicles.—J. S. A. Menier. Apparatus or means for propelling and steering balloons.—A. Waithman. Twine or cord and the mode or method and machinery or apparatus for manufacturing the same.—J. T. Creasy and W. Tully. Apparatus or machine for utilising the pressure of water, air, gas, or other fluid as motive power.—M. A. Popoff. Ventilating, disinfecting, and deodorizing cover for waterclosets, privies, urinals, night commodes, and other like utensils, also generally applicable to the disinfection and deodorization of fœtid or noxious gases and emanations.—J. Whitley. Purification of gas.

On May 7th.—1695 to 1709.—J. Deas and A. Nairn. Excavator.—J. Pinchbeck. Machiney for working in wood.—E. Jones. Tram and railway carriages, waggons, and engines.—E. Newbold. Arch and rake, either separately or in combination, for furnaces.—G. Hare. Photographic changing box and dark slide.—O. Trossin. Metals used as a preventive for the escape of steam and vapour whilst steam and gas are used as a motive power.—H. Brown. Apparatus for utilizing inflammable fluids for illuminating and heating purposes.—J. B. Handyside. Machine tools for grinding metallic surfaces by means of emery wheels.—J. Keats and A. Greenwood. Construction of hook for sewing machines.—P. Spence and F. M. Spence. Treatment of substances containing alumina and iron for the purpose of obtaining certain useful substances therein.—J. Gaskell. Rotary tool holder for potters' lathes.—S. E. Holten. Instruments for writing or printing (com.)—D. Oppenheimer. Machinery or apparatus for the manufacture of needles used for surgical and other purposes (com.)—C. Colwell. Apparatus for the rescue of mariners, and for enabling persons to maintain and propel themselves in the sea and other waters, such apparatus being partly applicable for other purposes connected with navigation.—W. R. Lake. Apparatus for expanding tubes (com.)

On May 8th.—1710 to 1725.—P. R. de F. D'Humy. Combinations of glass and ceramic substances applicable for architectural and other ornamentation, and for a variety of useful purposes.—G. Murdoch. Machinery for manufacturing tobacco.—C. Heinzerling and G. McGowan. Process for oxidising anthracene and improvements in the colouring matter produced therefrom. — B. Munro. Tools for cutting stone, coal, slate, marble, or similar materials.—J. Mactear. Manufacture of soda.—J. M. Clements. Sewing machines, and treadles for the same.—H. Booth and R. Watson. Method of and means for utilizing parts of healds which have been used in processes of weaving.—J. Stubbs and J. Corrigan. Machinery for winding two or more threads on to bobbins or spools preparatory to doubling the same.—J. Sawyer. Manufacture of fire lighters, and apparatus employed therefor.—F. W. Ewen and G. F. James. Insulating electric telegraph wires, and machinery or apparatus for manufacturing the same.—E. B. S. Mercer. Castor applicable to tables, chairs, beds, and other articles.—A. F. Martindale. Steam cultivator for land. — E. Johnson. Breech-loading ordnance, rifles, and fire-arms.—J. C. Stevenson. Manufacture of alkaline sulphates.—A. Manbre. Manufacture of sugar.—W. R. Lake. Manufacture of peat fuel, and machinery therefor (com.)

On May 10th.—1726 to 1738.—J. Siddeley and F. N. Mackay. Manufacture of ice, and apparatus or appliances employed therein.—M. Kosminski. Certain articles of dress.—G. A. Robinson and W. J. Kendall. Construction of perambulators. J. Gordon. Waste-preventing stop-cocks or valves.—F. H. Ziffer. Looms for weaving.—D. A. Smieton. Preparation or treatment of cloth to be used as covers, bags, and other analogous purposes.—J. Craven. Machinery or apparatus for manufacturing bricks, tiles, and other similar articles.—R. Duncan. Steam engines.—J. B. Tucker. Mounting papers, either printed, ornamented, or plain, on zinc, iron, tin, and other metal plates.—A. V. Newton. Carriage wheels and axles (com.)—J. M. Napier. Turning and shaping potters' clay.—F. Savage. Apparatus for cultivating land.—E. Butler. Attaching the covers of umbrellas and parasols.

On May 11th.—1739 to 1765.—D. Spill. Production of compounds containing xyloidine and the application of the same.—C. Hodgson. Constructing imitations of snow slopes or "montagnes Russes," and arrangements for moving vehicles thereon.—J. T. Dann. Construction of culinary vessels (com.) (Complete specification.)—J. Hastie. Steam steering apparatus.—J. H. Hitchon. Method of and apparatus for grinding the cards in carding engines.—W. Souter. Construction of dressing frames for waste silk, china grass, and other similar fibres.—J. Hill. Apparatus for expressing or separating liquids or moisture from semi-fluid, plastic, or solid substances or materials.—J. Bartlett and W. M. Murray. Printing and the manufacture of type.—E. Taylor. Heater for economising fuel and water for high-pressure steam engines.—A. M. Clark. Ratchet regulator for window blinds, ventilators, fan-lights, mirrors, and other like purposes (com.)—W. Stanley and W. J. Hale. Letter-boxes, letter-pillars, and other receptacles for letters and other packages.—J. Mallinson. Sluice and slide valves to regulate the flow of steam, water, and other fluids.—G. Black. Machinery for sweeping or cleaning chimneys, flues, and drains.—S. Hallsworth and R. Bailes. Purifying illuminating coal gas and the preparation of the means employed therefor.—L. Ludolph. Washers.—P. Wells. Manufacture of bolts, spikes, nails, screws, and rivets, and means or apparatus employed therein (com.)—A. T. Rousseau. Musical instruments, known as American organs.—W. Anson. Breech-loading small arms.—J. H. Johnson. Cans or apparatus for containing and supplying lubricants (com.)—M. Prentice. Treatment of natural substances containing phosphates of alumina. J. Yule. Barge for receiving sewage from points where it is collected, and for conveying it to a point of discharge at sea.—R. Montgomery. Automatic apparatus for ejecting water or other fluids from steam cylinders, chests, and pipes or other vessels, conduits, or receptacles. —J. McLachlan. Mechanism for driving shafts which revolve at a high speed.—W. Munro. Pump for forcing water, which may be used for extinguishing fires or for other purposes.—J. Steel. Brake block.—E. T. Hughes. Dyeing (com.)—J. Atkinson. Knife-cleaning machinery.

On May 12th.—1766 to 1774.—T. Brown. Percussive rock drills (com.) — J. Ainscow. Method of and apparatus for fixing the tyres upon railway wheels.—C. J. Webb. Linen and other fabrics, and looms for manufacturing the same.—C. H. Bazley. Apparatus for preparing cotton and other fibres for spinning.—B. J. B. Mills. Safety signals for railways (com.)—J. E. F. Ludeke. Self-motive-power (perpetuum mobile).—F. Worth. Horse-shoes (com.)—A. H. Elliott. Instrument or apparatus for drawing or extracting nails and other articles (com.)—C. Richardson. Method of treating and liquefying saccharine matters, for the use of brewers, sugar refiners, and others, and apparatus for carrying the same into effect.

On May 13th.—1775 to 1790.—H. W. Woolcott. Ship building.—L. Ludolph. Method for removing the incrustation from boilers, kettles, and other similar articles.—C. Johnson. Photographers' head rests, and stands used for other purposes.—E. J. C. Welch. Method of and means for effecting the adjustment of the spindles of multiple drilling machines, applicable also to other apparatus wherein the simultaneous adjustment of several parts is required.—S. Madden. Apparatus for regulating the combustion in steam boiler furnaces.—A. Budenberg. Emery wheels and apparatus used therewith, and the method of and apparatus for cutting and trueing the grinding surfaces of emery wheels (com.)—G. Haseltine. Machinery for the manufacture of thread-spools or reels, pail handles, and other like articles (com.) (Complete specification.)—H. N. Hornby. Apparatus or appliances for cleaning pipes for smoking.—A. Hutchison. Machinery or apparatus for making moulds for casting in metals.—W. H. Gilbert. Apparatus for distilling alcohol.—H. E. Newton. Pianofortes (com.)—E. Davies. Machinery or apparatus for making bolts, set-screws, and rivets. —E. T. Hughes. Lamps to be employed in diving operations (com.)—H. Gardner. Apparatus for tenoning or relishing sash, blind, door, and other rails or frames (com.)—K. H. Cornish. Furnaces.—J. Jameson and A. G. Schaeffer. Centrifugal pumps (com.)

On May 14th.—1791 to 1810.—A. Malfroy. Photographic apparatus with portable camera obscura (com.)—A. T. Machattie. Construction of ships having for their object to facilitate the saving of life at sea.—J. H. Johnson. Vehicles of railways and tramways, and means or appliances for signalling in such vehicles (com.)—J. Warran and T. A. Ellis. Stampers for crushing and pulverising ores.—A. Paul. Windlasses or ships' winding apparatus.—R. Wilson. Floating docks (com.)—E. Aubriot. Decorating or ornamenting glass.—H. Singleton. Graduated wheel tonguer or machine for manufacturing wheels.—W. Walkington. Automatic adjusting and deodorizing apparatus to be applied to closet lids.—J. Faulkner. Electrical appliances.—A. Muir. Lathes. — J. Percy. Apparatus for the raising and lowering of ships' boats.—R. Lansdale. Application of a certain material for preventing mildew in cotton and other fibrous substances. J. N. Maskelyne and J. A. Clarke. Means for actuating automaton mechanism.—T. Marshall. Manufacture of waterproof coats or garments and other articles of dress.—H. T. Brown. Method of recovering the brewers' wort and other matters retained with the hops after boiling or boiling and pressing, and in the arrangement of machinery for that purpose.—O. C. D. Ross. Distilling apparatus, and means for economically effecting the separation of sulphur from native ores and other substances.—W. E. Hall. Umbrellas and parasols. M. Prior. Compensating safety metallic pistons, valves, and anti-galvanic lubricant for same, applicable more especially to steam, water, air, or gaseous engines, to stuffing boxes, to circular or piston valves, and to air and water pumps.—A. M. Clark. Hydraulic engines, accumulators, and hoisting apparatus (com.) (Complete specification.)

On May 15th.—1811 to 1823.—W. Reid. Apparatus for saturating yarns and other textile materials with bleaching, preparing, mordanting, dyeing, clearing, or other liquids.—A. Fraser. Type composing and distributing apparatus.—B. C. Cross. Ventilators for sewers and drains.—H. Latour. Machinery for picking, carding, and spinning both old and new cordage and all materials suitable for the calking of ships, for combing flax and hemp, and for picking rags and other textile materials.—K. M. P. Loutit. Construction of lamps, applicable also for heating purposes.—J. Wallace. Pump for pumping water, air, or gases. —J. H. Carter. Disintegrators.—S. Ibbotson. Pedomotive wheeled horse or perambulator.—A. W. Finlayson. Mechanism or apparatus for applying tension to tapes or bands which are employed for driving spindles, shafts or other rotating bodies.—J. Whittingham. Millstone-dressing machine.—W. Topham, jun., and E. Snushall. Manufacture of metallic covers or lids for tea kettles, tea and coffee pots, and other vessels, and the manufacture of spouts for metallic vessels.—W. R. Lake. Button-hole casings (com.)—L. Chapman. Machinery and dies for producing elongated or socket eyes upon pickaxes, adzes, hammers, planters' hoes, and other tools and articles generally. (Complete specification.)

On May 17th.—1824 and 1825.—W. Keywood. Machinery and apparatus applicable to machines for making elastic looped fabrics for surgical purposes.—A. M. Clark. Photographic printing frames and other apparatus used in connection therewith (com.)

On May 18th.—1826 to 1835.—W. H. White. Pneumatic railway brake.—Hon. L. E. Stanhope. Manufacture of cricket balls.—P. S. Justice. Apparatus to deaden the noise of exhaust steam in the exit pipes of locomotive, steamboat, stationary, and other engines, and to arrest the sparks and cinders therefrom (com.)—C. D. Abel. Manufacture of shovels or spades, and apparatus therefor (com.)—K. J. Perceval. Construction of ships, mansions, warehouses, and other such like erections or buildings, whereby they are rendered fireproof, and whereby a fire occurring in any compartment or room is quickly detected and confined within the said compartment or room.—J. Wilson. Shuttles for looms.—R. J. Wood. Pyrometers.—W. M. Pollock. Machinery for stentering or finishing woven fabrics.—J. E. Simpson and C. Cross. Manufacture of cloth knows as "India Kutar," and of other cloths of a similar nature, and apparatus used in such manufacture.—E. Lasnier. Furniture casters.

On May 19th.—1836 to 1852.—J. Key. Construction of bedsteads and children's cots.—H. Loewenberg. Process and apparatus for manufacturing material imitating leather fabrics and the like; also wood, stone, or other surfaces embossed or otherwise figured.—W. F. Lotz. Mechanism for holding and adjusting the flat wicks of lamps.—J. Brennand. Manufacture of colouring matter suitable for dyeing and printing.—T. H. Keble. Smoking pipe.—R. F. Fairlie. Bogie engines.—I. Pickard. Casing or covering for cops of cotton, silk, or other threads, to be used on sewing machines or for hand sewing.—A. V. Newton. Railway crossings (com.)—G. F. Snelling. Treatment of animal blood, also of fibrous materials, and the manufacture of manures therefrom.—M. Anderson. Treatment of sewage.—W. Allan. Tube-plugs for marine boilers.—H. Doulton. Manufacture of earthenware pipes.—A. M. Clark. Method of impelling, conducting, or forcing air by the influence of a jet of air or steam, and applying the same to various purposes (com.)—W. R. Lake. Wood-screws and machinery for manufacturing the same (com.)—W. H. Avis. Machine for mitreing, tenon cutting, mortising, and blind punching.—J. T. M. Hircock and R. Hempsted. Horse-hoes, parts of which are applicable to other purposes.—R. Whitaker. Keyless-going barrel watches.

On May 20th.—1853 to 1859.—W. Cunningham. Machinery for hackling flax, jute, hemp, and similar fibrous materials.—H. A. Bonneville. Means of propelling steam ships (com.)—J. Smith. Deodorising blood to enable it to be used for manuring and other purposes.—J. H. Johnson. Permanent way (com.)—A. Tylor. Apparatus and arrangements for controlling, arresting, measuring, and recording the flow of liquids and fluids, and preventing the escape and waste of the same.—A. H. Beavan. Trucks for conveying cattle and horses.—W. Netherwood and B. Shaw. Bottles and the stoppers for the same.

On May 21st.—1860 to 1874.—M. W. Furth. Teasling apparatus. (Complete specification.) —D. Leproust and J. M. M. Clair. Apparatus for stuffing stools.—J. Townsend. Obtainment of phosphorous and phosphides.—J. L. Sabrinjie. Apparatus employed in the printing of photographs.—W. Jones and J. Walsh. Manufacture of sulphates of soda and potash, and calcining carbonates of soda and potash.—W. Morgan-Brown. Photometers, to be called the "pocket photometer" (com.)—L. Kleinen. Machine or apparatus for controlling and regulating the power of a locomotive engine.—J. H. Johnson. Rotary engines and other similar rotary apparatus and machinery or appliances employed in their manufacture (com.)—J. Behrens. Treatment of wool either in the raw or in the manufactured condition (com.)—N. Thompson. Stoppers for bottles, jars, and other hollow articles.—R. H. Hughes. Self-acting valves.—J. G. Weir. Sewing machines. —V. Blabon. Photometers or photo-phlogometers for measuring the intensity of the lighting power of gas in accordance with the size of the flame.—E. Lamprell. Ornamentation of skirts and other articles of apparel.—H. T. Davis. Apparatus for indicating and registering the fares received by tramway car and omnibus conductors and other persons.

On May 22nd.—1875 to 1889.—D. Lane. Printing machines.—L. Mariotti. Covers for teapots and other articles.—C. Mather. Construction of sea and river walls and embankments. J. Bailey. Construction of jacquard machines. —W. Lockwood. Safety valves.—W. Young. Machinery for dressing stone.—W. Middleton. Means or apparatus employed in melting, refining, converting, and puddling iron.—J. H. Johnson. Lamps and lamp burners (com.) (Complete specification.)—W. Simpson. Application and consumption of fuel in furnaces and fire-places, and apparatus therefor (com.)—E. H. C. Monckton. Construction and propulsion of ships and yachts.—H. H. Murdock. Preparation or manufacture of gunpowder charges for blasting (com.)—A. B. Walker. Machinery, plant, utensils, arrangements, and buildings of breweries and distilleries, and the working of such machinery and plant; which are also applicable in whole or in part to other purposes.—A B. Walker. Material and construction of casks and other vessels.—A. M. Clark. Processes for the manufacture of ammoniacal salt, and more particularly the sulphate of ammonia (com.)—A. M. Clark. Piston packings (com.)

On May 24th.—1890 to 1901.—A. Dunlop and W. Ree. Machinery and tools for cutting or dressing stone, marble, slate, coal, and other minerals.—C. Woodall and T. Wills. Means of and apparatus for the purification of gas.—M. H. Smith. Furnace bars.—T. Newcomb and T. H. Newcomb. Machinery for cutting wood.—E. Savill. Apparatus for skimming beer or other fermented liquors.—F. C. Hills. Purification of gas, and the preparation of materials to be used in the said purification.—W. R. Lake. Attachments for sewing machines (com.)—J. G. Willans. Apparatus for cooling air and for applying the same for cooling and refrigerating (com.)—C. D. Abel. Manufacture of cast-metal blanks for shovels, spades, scoops, and such like implements, and apparatus therefor (com.)—W. R. Lake. Feeding bottles (com.)—F. Geary. Manufacture of artificial fuel.—J. Seymour. Signalling the locomotive drivers, stokers, guards, and other persons on railways by means of signal rockets discharged from the carriages on the railway or railways.

On May 25th.—1902 to 1911.—W. M. Scott. Breech-loading small-arms.—H. J. H. King. Apparatus for supporting ratchet drilling braces and other tools.—L. Maas. Pipes and pipe bowls for smoking (com.)—W. E. Gedge. Method of manufacturing smooth and bright cast iron (com.)—W. L. Morgan. Construction of rotary engines.—J. Yeadon. Means or apparatus for fixing and supporting "scaffolding," part of which invention is also applicable for raising material into the same.—G. Sinkwell and E. H. Tooley. Machinery for elevating, shooting, loading, and unloading sacks when filled with corn, produce, or other merchandize, also applicable for other hoisting and loading purposes.—H. Deacon. Manufacture of chlorine. —J. H. Johnson. Finders or apparatus for measuring distances (com.)—J. Higginbottom and E. Higginbottom. Machinery or apparatus for scouring wheat, rice, or other grain.—T. S. Dobson. Furnace bars.—J. Kirkman. Draw-bar apparatus for railway carriages and waggons.—F. F. Burlock. Lathes, chiefly designed for turning shafts or bars (com.)

On May 26th.—1915 to 1934.—C. Williams. Annealing pot.—T. Smith. Planing machines. —R. Milburn and H. Jackson. Treatment of salt or crude chloride of sodium preparatory to chemical processes.—C. Scott. Fœcal closets. —H. R. Lumley. Effectively breaking up ice which otherwise bars and prevents navigation. —J. W. Corbett. Kilns.—H. C. Taylor. Manufacture of cornice pole and other rings.—W. J. Martin and J. Ashley. Machinery or apparatus for spinning and twisting fibrous substances.—W. E. Gedge. Composition of lubricating oil or matter (com.)—G. Velge. Process of removing phosphorus from iron ores and refining slag or scoria.—A. V. Newton. Hoisting apparatus (com.)—R. Dunn. Furnaces. J. H. Johnson. Steam engines (com.)—T. W. Greaves. Solitaires.—A. D. Turner. Apparatus for cutting toothed gearing.—T. Forster. Preparing or finishing silk, cotton, flax, hemp, or other threads used for sewing purposes.—O. G. Bolitho. Brake and signalling apparatus on railway trains, parts of which invention are available for other purposes.—B. J. B. Mills. Liquid meters (com.)—D. Nicoll. Construction of ships, boats, and other vessels, and in preserving the bottoms thereof from oxidation and incrustation, parts of which improvements are applicable to the preservation of metal, wood, and other substances.—A. Browne. Method and apparatus for manufacturing artificial foliage of vulcanized india rubber (com.)

On May 27th.—1935 to 1951.—W. Benton. Sad, box, and other hand irons for smoothing fabrics. —W. Audinwood. Chaff-cutting machines.—H. A. Bonneville. Improved oven for baking bread, meat, and other food, applicable for other purposes requiring fire or heat (com.) (Complete specification.) — F. Field and R. Talling. Preparation of insulating compounds for coating electric telegraph wires and other purposes.—A. Walker. Suspending and maintaining a ship's cabin or saloon in a level position at all times.—F. M. Willson. Knitting machines (com.)—W. R. Holyoake. Process of, and printing ink for, transferring designs, patterns, or devices on to vitreous or glazed surfaces.—J. Jordan. Apparatus for circulating water in boilers.—J. Jordan. Tube stoppers for boilers.—J. Jordan. Machinery or apparatus for cutting stone or other material substances.—L. Eaton. Regulating chronometers, watches, and clocks. (Complete specification.)—J. H. Johnson. Treatment of alunite, or of natural products containing the same, so as to obtain luminous compounds therefrom (com.)—J. Laidler. Apparatus for facilitating the taking and reading of shorthand and other reports, notes, and memoranda.—W. L. Copp and C. White. Apparatus for the manufacture of gas.—A. E. Pinching. Construction of safety lamps.—D. Wood. Wrenches and spanners.—C. Besancon. Spring button.

On May 28th.—1952 to 1965.—W. A. Riches. Apparatus for feeding or mixing definite proportions of different grains or seeds, or different qualities of the same grain or seed.—F. C. Jones. Supplying and regulating the supply of water by means of a self-acting apparatus for urinals and other purposes.—J. J. Coleman. Treatment of the excreta of towns.—G. T. Livesey. Apparatus used in the purification of gas.—F. Ramsay. Sail hank or shackle (com.) (Complete specification.)—J. E. Massey. Date and other stamps having moveable type, in the mode of securing or fastening the face to the body of the stamp when closed, and the handles thereof.—W. Salter. Haymaking machines.—W. Haworth. Machines or apparatus for rolling tea leaf.—H. J. Herbert. Means for advertising. P. Spence and F. M. Spence. Treatment of ferric and aluminous and ferric matters for the purpose of obtaining useful substances therefrom.—P. Jensen. Mode of and apparatus or balance for ascertaining the loss of wool in weight by the process of washing (com.)—J. B. Moscrop. Machinery for doubling yarn.—M. Ker. Apparatus for supporting the shelves of book cases and other shelves.—J. J. West. Gas stoves.

On May 29th.—1966 to 1976.—W. Shorrock. Looms for weaving.—W. Morgan-Brown. Anti-incrustation batteries for boilers (com.) (Complete specification).—A. H. Legge, and J. S. Richardson. Steam engines.—T. Pickering. Means for protecting the openings or doorways communicating with hoists.—G. L. Shorland. Apparatus for warming and ventilating rooms and buildings.—E. Kunkler. Method of making malt from raw grain, and in the machinery and arrangement of machinery for that purpose. —D. Wilks. Collecting, receiving, and treating the vegetable and animal refuse and sewage of large towns and in treating the same for the manufacturing of manure, and the production of a fine carbonaceous powder to be used as an agent for filtering sewage water, house drains, and other obnoxious fluids, as well as absorbing and deodorizing exhalations from waterclosets, urinals, and other places, and the means employed therein, as also the application of the aforesaid powder to the preservation of food.—S. E. Gee. Machinery or apparatus for cutting and screw-threading pipes and other articles, and tapping nuts and pipe fittings (com.)—H. Schroeder. Dyeing woven fabrics.—J. H. Wiggins, and S. L. T. Carvell. Amalgamating machines (com.)—G. W. Hart. Manufacture of alkalies and hydrochloric acid (partly com.)

On May 31st—1977 to 1992.—W. Bull. Construction of kilns for burning bricks and other goods. (Complete specification.)—J. G. Tongue. Moulding or casting cores or core pieces, and in the moulds employed for this purpose (com.)—T. B. Howell. Self-resisting plank levers for pianos.—H. P. Holt. Methods for preventing loss of life and damage to property from the breaking of ropes, chains, connections, or machinery in hoists and shafts.—J. Robinson, and A. Settle. Pin or pirn winding machines. —F. H. Relph. Fittings for carrying cattle or other animals in vessels or carriages at sea or on land.—M. Henry. Mode of and apparatus for impelling, propelling, or moving carriages, boats, and other bodies (com.) — W. Thackthwaite. Construction of wheel or roller skates. —F. C. Richardson. Construction of furnace bars.—D. Drummond. Fastening tires on wheels.—J. Jones. Portable folding chair or seat particularly adapted for railway travelling J. H. Johnson. Preparation of mirror-plates or looking glasses (com.)—H. Shackler and J. Newsam. Feeding of thrashing machines, and protecting the drum of the same to prevent accidents to the persons employed in attending to the same.—W. Nelson. Manufacture of steel pens, also applicable in the production of other useful articles.—H. W. Whitehead. Improvement in Noble's and kindred combing machines.—W. L. Anderson. Apparatus for producing equilibrium in ships' cabins, applicable also to furniture and other articles used on board.

On June 1st.—1993 to 2009.—E. P. H. Vaughan. Envelope for letters (com.) — W. Brookes. Means or apparatus for conducting and controlling the flow or passage of water, gas, or other fluids or vapours (com.)—M. J. Grandjean. Breach-loading fire-arm.—E. Edwards. Steam-engines.— T. Christy. Waterproofing fabrics (com.)—R. E. Harris. Apparatus and mode of signalling to prevent collisions at sea by steamers.—A. C. Henderson. Manufacture of cloth (com.)—C. F. Schussler.—Hydro-carbon gas apparatuses.—A. A. Mondollot. Apparatus for the manufacture of gaseous liquids.—A. Collet. Steam generator with boiler or vaporizator rivets. — H. Deacon. Manufacture of chlorine.—D. Leonardt. Manufacture of cigars and apparatus to be employed in the said manufacture.—J. Frearson. Manufacture of certain kinds of screws, and tools and machinery to be used in the said manufacture.—C. F. Amos and H. W. R. Smith. Expansion valve gear.—A. M. Clark. Apparatus for the separation of the oily and farinaceous constituents of maize, and the application of the same for the manufacture of various useful products (com.)—A. Weldhen. Combining certain articles of furniture, such as wardrobes, cabinets, wash-stands, looking-glasses, racks, shelves, and other like articles (com.)—W. R. Lake. Toy menageries (com.)

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